JULY 12, 1951

IRON AGE

VOL. 168 NO. 2

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THE IRON AGE
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DIGEST

of the week in metalworking

NPA SHAVES "FREE" STEEL TO A WHISKER
PAGE 15
National Production Authority has virtually slammed the door on nonessential civilian steel consumers beginning in September. Drastically higher set asides for Controlled Materials Plan, plus a much higher base period, bring "free" steel supplies down to a whisker. Total CMP ahead?

PRESSURE ON TO FINISH ENGINE PROGRAM
PAGE 76
Car manufacturers will "tool around" machines to finish high compression engine program. Car production on the average will see cutbacks due to material squeeze, vacation, and labor troubles. Packard now preparing for production of B-47 bombers which are the fastest in the world.

WEST'S IRON PRODUCTION NEEDS SURVEYED
PAGE 81
Lack of metals and need of iron production facilities are being reviewed by Kaiser officials. Doubts exist concerning rumors of new western shipbuilding. These costs are too far out of line. Announcements indicate increased aluminum, tungsten and copper facilities are being constructed.

KOREAN PEACE TALK SLOWS CONTROL PLANS
PAGE 83
Truce talk in the Far East is building up a wait-and-see attitude in Congress toward renewal of the Defense Production Act. At the same time, international tension has jolted stockpile aims from $3.2 billion up to $8.8 billion. Deliveries and contracts to date now total about $3 billion.

BORON STEELS—A NEW ERA IN METALLURGY
PAGE 85
In most cases, fatigue tests on boron steels are better than the steels they replaced. Hardenability, though similar, is not identical. Boron carburizing grades have replaced 3310 and 9310 in several heavy duty truck and aircraft applications. This is the second article in the boron steel series.

FASTER METHOD OF ANALYZING STAINLESS
PAGE 91
Chemical-spectrographic analysis of tantalum-columbium line intensity ratio and weight ratio is at least as accurate as any other routine method. It is faster than the point-to-plane technique, and it doesn't require the use of stainless steel standards previously analyzed for tantalum.

ANNEALING FURNACE FITS LOW HEADROOM
PAGE 93
When an already-existing plant facility was bought for an expansion program, its low headroom required design of a special wire annealing furnace. Its pan-pull transfer car loading system eliminates overhead handling. For the handling of coils and loading of pans, fork trucks are used.

WINTER INDUSTRIAL FUEL WILL BE SCARCE
PAGE 107
The seasonal problem of industrial fuel supply willl be tougher than ever this winter. Natural gas and oils are expected to be the real trouble spots. In many cases the former can be shut off to industrial users without warning if demand from domestic consumers shows a large increase.

TUNGSTEN—SHORTAGE THREATENS DEFENSE
PAGE 109
A Senate committee blames the Army and Munitions Board for a tungsten shortage which is threatening defense production. Our tungsten stockpile is described as "pathetically small." A shortage is seen, even when defense needs of some large shell programs are not included in the total.

DEFENSE—BOOM RATE NEEDED 2 MORE YEARS
PAGE 110
To reach safe goals of military strength for defense, the boom rate of production will have to continue for at least 2 years, DPA reports. The record so far shows that steel expansion has outpaced that of overall industry. At the same time defense production was noted as still tooling up.

MOST COMPANIES COMPLY WITH NPA ORDERS
PAGE 111
Staff of 300 begins audit of industry compliance with NPA orders. Results so far show that most firms try to play ball. Investigators have uncovered some gray market bait. May exchange velvet glove for iron hand if needed, but educational methods will be given every chance to succeed.

STITCHING, A GROWING FASTENING METHOD
NEXT WEEK
Cheaper, faster metal stitching is replacing riveting and other joining methods in a wide variety of products. In some cases production has been upped as much as 700 pct at a cost of 9¢ to 12¢ per 1000 stitches. Shear and tensile strength is good. Relatively unskilled labor is employed.

Only with B. F. Goodrich grommet belts can you make these savings!

Save 3 ways! Investigate today! Write or mail coupon

You save belt costs because belts last longer, save production costs because machines keep running with fewer interruptions, save maintenance costs because they need less attention.

Patented grommet belts by B. F. Goodrich represent the only basic change since invention of the V belt. Belts last 20 to 50 per cent longer, depending on service. (The more severe the service, the greater the increase over ordinary belts.) Grommet belts have more rubber; they're more flexible, give better grip, less slip.

What is a grommet?

A grommet is like a giant cable except that it's *endless*—a cord loop built up by winding heavy cord on itself. There is no overlapping cord *section* as in all ordinary belts. Most belt failures occur in these sections where cords overlap!

All cords put to work

Each of the two grommets and every part of a grommet carry their share of the load. In ordinary belts under high tension the center cords "dish" because tension is greater near the driving faces. Dished cords are doing less work, not pulling their share. Grommet belts have no center cords, there is no dishing—therefore much more strength in proportion to cord volume—and less stretch. Grommet belts stretch, on an average, only about one-third as much as ordinary belts.

Better grip, less slip

Grommet belts have more rubber in relation to belt size. Without any stiff overlap, they're more flexible, grip pulleys better. Size for size, grommet belts give ⅓ more gripping power, pull heavier loads with a higher safety factor. Because there is less slip, there is also less surface wear.

Send for proof

Send the coupon for a set of reports telling users' experiences and showing actual installations where grommet belts outlasted all others. Some typical cases:

". . . within a few days ordinary belts had stretched . . . After six months of 24-hour-a-day service BFG grommet belts haven't stretched at all . . ."

"Ordinary belts lasted only 5 or 6 weeks . . . B. F. Goodrich grommet belts are in their sixth month of service . . ."

"Previous belts suffered from shock loads, wore out fast . . . BFG grommet belts have been in service 2 years with no shut-downs..."

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BFG grommet belts cost not one cent more than others. The savings they make for you are clear profit. They are made in C, D and E sections. They are patented by B. F. Goodrich. No other V belt is a grommet belt (U. S. Patent No. 2,233,294).

Write, send the coupon or see your B. F. Goodrich distributor. (He will show you his "X-ray" belt that shows the grommet construction clearly.)

Grommet Belts BY

B.F.Goodrich

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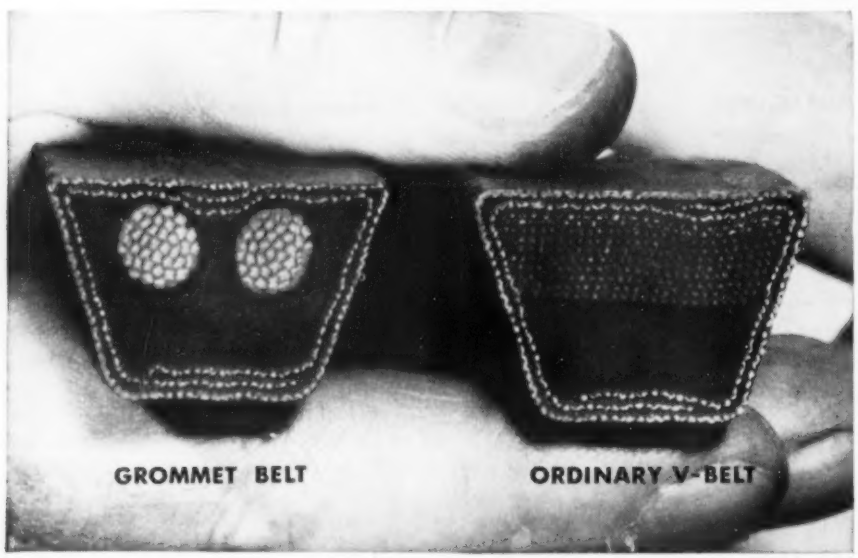

The B. F. Goodrich Company
Dept. IA-7
Akron, Ohio

☐ Send set of reports telling users' experiences and showing actual installations proving that B. F. Goodrich grommet belts outlast all others.

☐ Have distributor show me the "X-ray" belt that shows how B. F. Goodrich grommet belts are made.

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IRON AGE

editorial

Let's Stay on the Alert

THE Russians hope our defense program will fade away. They have shown the world that they could control their puppet—Red China—if they wanted to.

The commies did not bring up the peace proposal because they love peace. Anyone familiar with Stalin's tactics knows there is something else brewing—if not for the immediate future, then later. Unfortunately we will find out what it is after they start it.

Red China had to go along because they get help from Russia. Also the North Koreans are starving and it is rice planting time. As a side issue a ceasefire will allow the rice paddies to be sown again—that means food. Food means a buildup of civilians and soldiers.

We don't pretend to say that the Red Chinese will stop now so civilians can raise food and then will start a war again in the fall. But communism—being what it is—is entirely capable of such a trick.

Russia could have started this peace move in order to wreck our defense program—the odds favor such a trick. Now is the time for her to try this. We are only getting started. To wait until the weapons are on the assembly line would be too late.

There are millions of Americans who appear incapable of understanding what the Russians are up to. They just won't believe the commies hope to rule the world. Nor are these Americans fully conscious of the methods commies use.

Let's repeat their weapons, other than military items: phony peace moves; inflation; strikes; blatant lying propaganda; infiltration; fellow travelers; misguided idealists; the blow-hot-and-cold temperament of many Americans; and the utter disregard for human values.

Of course we have to go through with the effort to make peace in Korea. That's the way we and our allies live and think. Even if we find out later that the effort is wasted.

There is one thing we must not do. We must not let public lethargy hurt or hinder our defense program one iota. Unless we become strong quickly we may not have the chance again.

Peace negotiations? Yes! But let's remember the nature of the commies.

Let's stay on the alert—all the time.

Tom Campbell

Editor

You don't need to worry about tubing service, when you have

National Seamless Alloy Steel Tubes

With conditions as they are today, it's good to know that you have NATIONAL Seamless in your equipment. Nothing brings more satisfaction than the feeling of security that comes with your having made the wise decision to use the most reliable materials at the time of installation.

Now more than ever, the advantages of National processes come to light, when additional strain and stress accompany the grueling operations in today's feverish race to produce—and to produce more and more—of essential products or services.

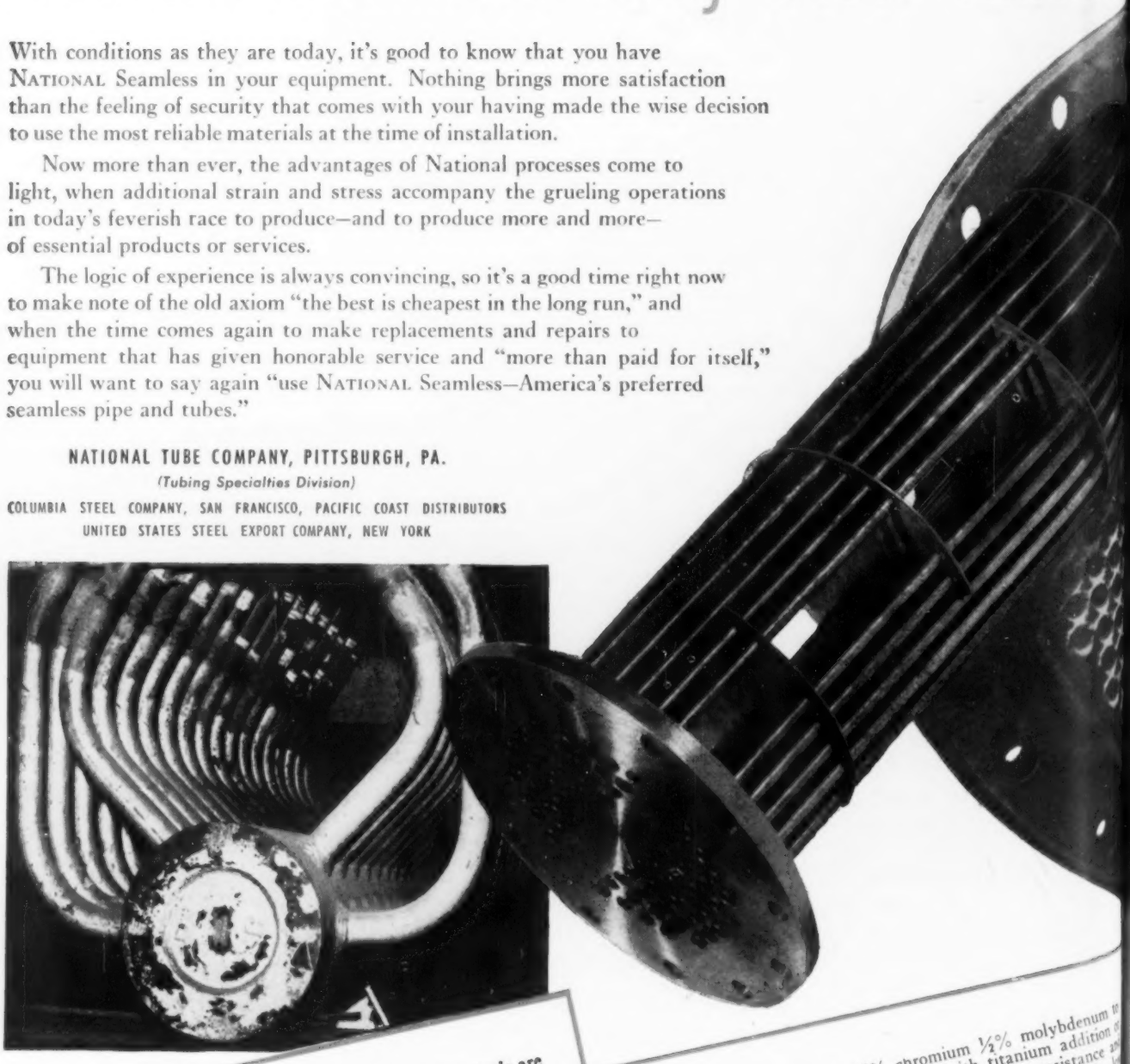
The logic of experience is always convincing, so it's a good time right now to make note of the old axiom "the best is cheapest in the long run," and when the time comes again to make replacements and repairs to equipment that has given honorable service and "more than paid for itself," you will want to say again "use NATIONAL Seamless—America's preferred seamless pipe and tubes."

NATIONAL TUBE COMPANY, PITTSBURGH, PA.

(Tubing Specialties Division)

COLUMBIA STEEL COMPANY, SAN FRANCISCO, PACIFIC COAST DISTRIBUTORS

UNITED STATES STEEL EXPORT COMPANY, NEW YORK



LOW NICKEL ALLOYS (3½% and 5% Nickel). These alloy steels are widely used where high impact resistance at sub-zero temperatures is desired. Additionally, they are used to combat general corrosion by neutral salt solutions such as sodium and potassium nitrate or sulphate. They are also advantageous in minimizing caustic embrittlement—a special type of corrosion occurring when stressed carbon steel is in contact with hot alkaline solutions. Soda and Kraft paper mills find these nickel steels give increased performance over plain carbon steel in black liquor evaporators.

MEDIUM CHROMIUM ALLOYS (5% chromium ½% molybdenum to 9% chromium 1% molybdenum—some with titanium addition of high silicon content). These alloys have oxidation resistance and strength characteristics at high temperatures similar to the low chromium alloys. Corrosion resistance, particularly to sulphur compounds such as SO_2 and H_2S, is generally appreciably better than that of the lower chromium alloys, hence they find application where the latter group does not afford sufficient increase in service

IRON AGE *newsfront*

news methods and product forecast

► Top executives in industry as in Washington fear that Korean peace moves will seriously jeopardize long range defense plans -- which is undoubtedly a Soviet objective. But continued oil trouble with Russian activity in Iran could mean gasoline rationing. This would give long range defense planning even more public backing than it got during the retreat toward Pusan.

► A growing number of scrap iron and steel companies are taking advantage of rapid amortization provisions of the Defense Production Act. Mechanization of yards, which had been moving slowly but steadily, will get a boost in yards that get certificates of necessity. It will ease a growing labor shortage in the scrap industry.

► Now that the "battle of automatic transmissions" has ended with everyone claiming a complete victory, the next automotive rhubarb will be over compression chambers. Chrysler's V-8 has brought into the open research which had been proceeding quietly for years. Captured German vehicles yielded some of the secrets that are being worked into U. S. designs.

► Looking over steel supply prospects a leading conversion steel broker has decided to bet on continuing tight supply. He has been buying up steel right and left, feeling that current softness in conversion steel will soon vanish.

► An anticipated shortage of low-sulfur residual fuel oils is causing some steel companies to consider relaxing their specifications from a maximum of 1.00 pct sulfur to 1.50 pct.

► Output of critical chrome ore from New Caledonia will be stepped up by U. S. equipment purchased through ECA, plus more than $1 million in French counterpart funds.

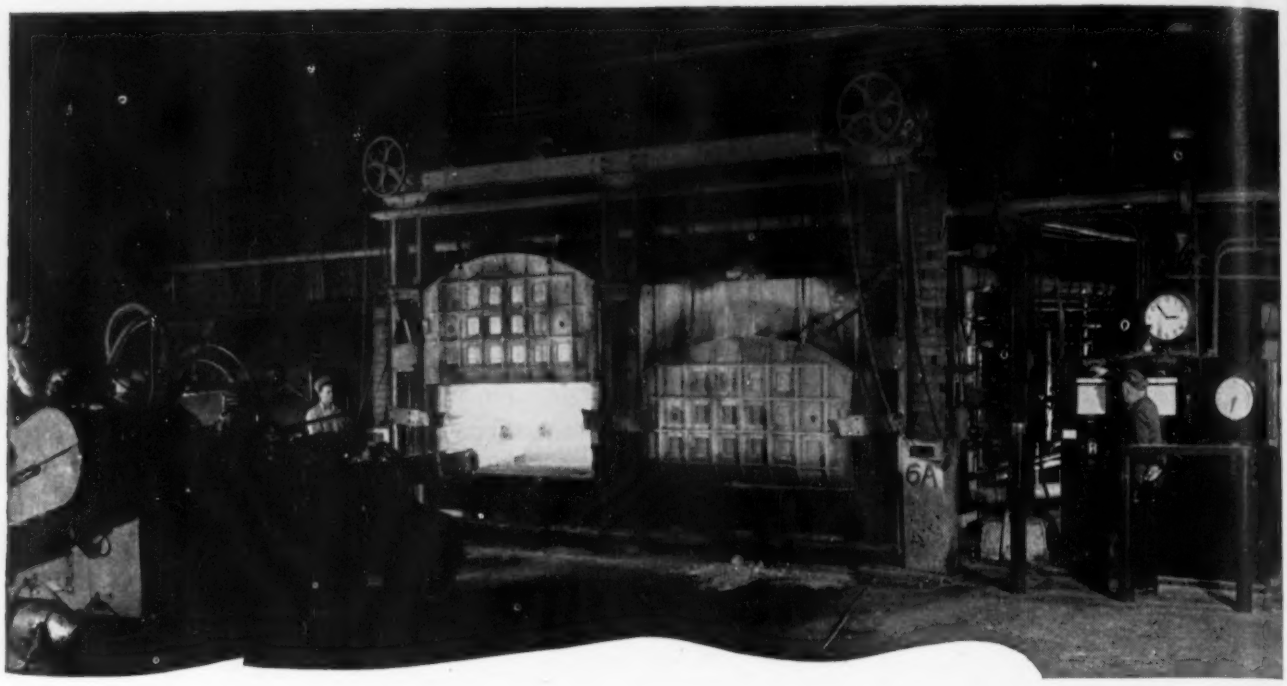
► Due to the critical alloy shortage AISI will shortly announce 14 new boron steel grades. Three will be of the carbon-boron 14BXX type; the other 11 will be a 50BXX series containing 0.20 to 0.60 Cr.

► As it would to other phases of defense, peace in Korea would throw cold water on the industrial scrap drive now under way and require more work to get material moving to the mills. It may take some bad losses to bring out the real shortage.

► Some builders of standard machine tools -- lathes, drill presses, etc., -- have not felt the impact of defense orders. These companies report orders falling off since June and they can offer 6 to 7-month delivery -- which is normal.

► As automobile production drops during July the cutbacks will not fall evenly across the board. GM and Ford are expected to hold to within 10 to 15 pct of the June level while Chrysler will probably be off more than 20 pct. The independents will try to hold the line but will lose output to tight materials, vacations, and in some instances, labor trouble.

► Faced with short supplies of cobalt during World War II, the Japanese developed and used iron, nickel and nickel-cobalt catalysts to make synthetic liquid fuels from coal, replacing the cobalt they had formerly used as a catalyst.



This New Controller Says "Hurry Up, Furnace!"

With production reaching toward all-time highs, this new P.A.T. 50 Control already is helping many key plants increase the output of their furnaces. Here's why:

This Control has something that's brand new in proportional, electric controllers. Called "rate action," this feature enables the Controller to act on the *speed* of swings in furnace load, as well as on their size and on the length of time they persist. Thus, if temperature changes gently, it is gently nudged back into line. But if it starts off vigorously—as when the furnace door is opened—P.A.T. 50 reacts vigorously. Then, when the change has been headed off, the Controller starts to back away. But "putting on the brakes" it brings temperature in line smoothly and rapidly.

Thus, "Rate Action" increases production because it reduces the length of time a furnace is off temperature.

Also, Proportioning and Reset Actions are more responsive than before. These two components stop the normal temperature swings which are started by changes in the size and permanence of the furnace load. Even without rate action, these increases would enable P.A.T. 50 to do a better-than-ever job. With rate action, results are superior to any previous electric control.

The News is in the Control Unit at bottom of panel shown at right. Earlier installations can be converted to P.A.T. 50 by replacing the Unit and making slight changes in the Controller.

For details, contact our nearest office, or write us at 4956 Stenton Ave., Philadelphia 44, Pa.

THESE furnaces and controllers are part of the slab-heating equipment with which The Timken Roller Bearing Company, Canton, O., conditions high-alloy steels for rolling. The Timken Company has used many earlier L&N Controllers. They find P.A.T. 50 is a further step forward, not only in guarding quality, but also in increasing production by shortening the off-temperature time.

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IRON AGE *summary*

iron and steel industry trends

NPA orders staggering boosts in steel set asides . . . Closed-End CMP may be next move . . . Talk of easier steel fades with the breeze.

Awful Truth — By September civilian steel consumers will either be virtually out of the steel supply picture—or they will be included under the controlled materials plan. National Production Authority has made two sudden moves that will greatly increase the amount of steel marked for distribution under CMP. At the same time "free" steel supplies will be shaved to a mere whisker.

NPA's first move was to change the base period to which steel-set-aside percentages are applied from the first 8 months of last year to planned September production or to April and May of this year, whichever is larger. Either new base is a period of much higher production.

NPA's second move was to greatly increase the percentage set asides on carbon steel products which steel firms must make available for government programs. The higher percentages of the higher-output base period will become effective with September production. Lead time for placing orders will be 45 days.

Staggering Boosts—Some of the increases in steel set asides are staggering. For example, ingots were raised from 15 pct to 95 pct. Blooms, billets and slabs were raised from 52 pct to 95 pct; tube rounds, from 60 to 95 pct; nails and staples, from 25 to 90 pct.

Set asides for most carbon steel products now range from 90 to 100 pct. Among the items calling for 100 pct set aside are: Tube rounds, oil country goods, line pipe, and rails and track supplies.

Lethal Blow—Receipt of NPA's telegram informing them of these revisions threw steel company sales offices into an uproar. They were already swamped with the work resulting from the shift to CMP, and the change of signals almost knocked them for a loop.

Closed-End CMP Next?—If NPA next decides to change the present open-end CMP to a closed-end plan there will be few objectors. The reason is that those industries still struggling to operate outside of CMP could hardly fare worse if they are included under the plan. Steel company resistance will largely fade away when they try to divide 5 or 10 pct of their production equitably among their customers..

Actually, many believe a closed-end CMP is logically NPA's next move. Consumer durable industries such as autos and appliances have already been ordered to file fourth quarter requirements. This would be the first move if they are to be included.

Just Talk—Talk linking easier steel with peace moves in Korea may not be dead but it has surely faded away. Regardless of what happens in Korea most steel products will be in extremely short supply throughout this year and well into 1952. There will continue to be some backing away from higher-priced gray market and conversion tonnage. But this will result from a profit squeeze, not from a lack of appetite among steel users.

Both steel consumers and producers realize that there will be no letup in government buying for the rest of this year. Many orders placed several months ago are just now ready to go into production. Many other orders are still in the tooling stage. The outlook is for more steel demand resulting from the defense program, not less.

Ingot Rate Up—Steelmaking operations this week are scheduled at 101.5 pct of rated capacity, up half a point from the previous week.

(Nonferrous summary, p. 156)

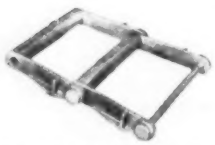
No ONE chain serves every purpose

LINK-BELT makes all types of chains

Link-Belt inclined conveyor moves cans from leak test to painting booths. Link-Belt SS steel roller chain provides exact positioning with K-2 attachments and steel pusher rods every fourth link.

...recommends the right one for your job

Typical chains from the complete LINK-BELT line



Class H drag chain—for drag conveyors, handling shavings or other refuse in runways or troughs.

Class C combination chain — popular, durable, low cost design for elevators, conveyors.

Class SS bushed roller chain with offset sidebars —for heavy drive service at moderate speeds.

Transfer chain with tilting dogs—for plate and slab travel, loads up to 300,000 pounds.

More than strength — more than length — all operating qualities are taken into consideration by Link-Belt engineers when they recommend a chain for your job. From the world's most complete line of chains, they can select the *right type* to meet your specific requirements — large or small. Link-Belt builds them all. And all are built to the highest standards. Exact control of materials and manufacturing processes is your assurance of longer chain life. 12.327

LINK-BELT COMPANY: Chicago 9, Indianapolis 6, Philadelphia 40, Atlanta, Houston 1, Minneapolis 5, San Francisco 24, Los Angeles 33, Seattle 4, Toronto 8, Springs (South Africa). Offices, Factory Branch Stores and Distributors in principal cities.

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STANDARD LEATHER CUP SEAL ASSEMBLY SHOWN IS INTERCHANGEABLE WITH STANDARD PISTON RING PISTON ASSEMBLY

MILLER *High Pressure* HYDRAULIC CYLINDERS

Meet J. I. C. HYDRAULIC STANDARDS

(Write for FREE copy of these "Standards")

Years before the Joint Industry Conference (J. I. C.) Standards for specifying "quality" hydraulic equipment were adopted, the *standard* design and construction features of Miller High Pressure Hydraulic (2000-3500 psi) Cylinders already included ALL the specifications for cylinders, seals and pistons now called for by the "Standards". Hard chrome plated, scratch-resistant piston rods and dirt wipers have long been standard Miller cylinder features yet are required by the "Standards" only under severe conditions.

Solid steel heads, caps and mountings which eliminate costly, dangerous breakage even under the severest operating conditions represent an "extra-quality" standard Miller cylinder feature which actually exceeds the high quality set by the J. I. C. Standards.

The Miller "Patented" Hydraulic Piston Rod Seal which has no manual adjustment and is automatically self-adjusting and wear-compensating to give life-long leakproof service without ever requiring any manual adjustment whatsoever . . . far surpasses the requirement of J. I. C. Standard H6.2.5 which specifies "Stuffing boxes for automatic packing shall be so designed as to prevent adjustment beyond the functional limits of the packing"

Benefits to You

No Broken Castings

No Scratch-Damage to Piston Rods, Bushings and Seals

NO COSTLY "DOWNTIME"
NO REPAIRS
NO MAINTENANCE
NO POWER WASTAGE

Write for illustrated cylinder bulletins A-105 and H-104

COMPLETE MILLER CYLINDER LINE INCLUDES: AIR CYLINDERS, 1½" to 20" BORES, 200 PSI OPERATION; LOW PRESSURE HYDRAULIC CYLINDERS, 1½" TO 6" BORES FOR 500 PSI OPERATION, 8" TO 14" BORES FOR 250 PSI; HIGH PRESSURE HYDRAULIC CYLINDERS, 1½" TO 12" BORES, 2000-3000 PSI OPERATION. ALL MOUNTING STYLES AVAILABLE.

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Workmen gain time assembling with Pheoll screws, bolts, and nuts because they are accurately threaded, drive easily, seat rapidly, grip tighter—assuring stronger assemblies, easier inspection and less rejects.

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The uniform quality of Pheoll Fasteners improves your product appearance. Precision slotted and finished heads, cleanly chamfered nuts, prevent marred surfaces and add to your product's sales appeal. Write for Pheoll literature and price list.

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Dear EDITOR

letters from readers

Who's Telling Whom?

Sir:

A couple of times I have mentioned that I like your editorials, and I especially liked the one of June 28 "Who's Telling Who(m)?"

Many of us are inclined to believe that T. A. (Typical American) Jones knows things but sometimes I wonder if we rightly judge T. A. For instance, if T. A. is aware of the things that are wrong that will eventually hurt him, why does he support his representatives in government who continue them? No one is in favor of continuing that which will eventually hurt him.

It could, therefore, be a case of T. A. really not knowing, or if he does, too many "Typical Americans" coasting along with the feeling that "the world's treating me all right, why bother."

I think we have a dual job to do—first, to see that T. A. is informed and second, to get him steamed up on the importance of the moral standards upon which our nation was founded.

You are doing an outstanding job in both categories and I wish your editorials had syndicate coverage so that more of the public could see them.

W. W. SEBALD
President

Armco Steel Corp.
Middletown, Ohio

Sir:

This is ridiculous! It's getting so that every time I read an editorial in THE IRON AGE I start saying, "Amen" and your latest "Who's Telling Who(m)?" is no exception.

Your thinking sounds exactly like our family discussions at the dinner table.

F. D. ROWLEY

Copperweld Steel Co.
Warren, Ohio

Commendation

Sir:

Generally I overcome the urge to commend an author, but I feel impelled to tell you that your editorial in the June 14 issue, "Heart or Head?" is superb. Your other editorials also have been commendable but that one is superior to all others in my opinion. May the preparation of those editorials continue to bring to you much joy.

While we are awaiting the expansion of the iron and steel industry in this area I will look forward to enjoy continually your editorials.

L. G. PRICHARD

The First National Bank
Portland, Ore.

Gratitude

Sir:

The Anglo-American Council on Productivity and the Economic Cooperation Administration wish to take this opportunity to express their gratitude to your technical editor, Mr. D. I. Brown, for the splendid cooperation he has given the subject team on their visit in the United States.

J. G. CHAPMAN
Project Manager

Economic Cooperation Administration
Technical Assistance Arrangements Branch
New York

Courtesy

Sir:

I like very much the editorial "Courtesy—A Two-Way Street" appearing in your May 24 issue. With your permission I'd be happy to reproduce it in our employees' weekly publication, "The Wingfoot Clan," which has about 26,000 circulation.

M. L. FELBER
Editor, The Wingfoot Clan

The Goodyear Tire & Rubber Co., Inc.
Akron, Ohio

Boron Steels

Sir:

Will you please let us know if you have at any time had an article in your publication covering boron steel. We are anxious to obtain detailed information regarding the chemical and physical analysis of boron.

W. T. MILLER
President

The Miller Steel Co., Inc.
Hillside, N. J.

You're just in time. See p. 85.—Ed.

Ultrasonics

Sir:

In your May 15, 1941 issue there appeared an article entitled "Ultrasonics A New Metallurgical Tool" by C. M. Casman. We are supposing that by this time there may be several firms who manufacture devices in this field.

We will appreciate it if you will send us the names and addresses of such firms from whom we may receive literature on this subject.

L. D. PEIK

Louis D. Peik & Associates
Akron, Ohio

A more recent story has appeared in THE IRON AGE covering the use of ultrasonics at Heppenstall Co., Pittsburgh—"Sonic Tests Spot Flaws in Heavy Forgings," Apr. 13, 1950, p. 77; Apr. 20, 1950, p. 88. We suggest you contact Sperry Products, Inc., Danbury, Conn. who manufactures the supersonic reflectoscope used by Heppenstall Co.—Ed.

THE ALLOY STEEL YOU'RE GETTING on quenching methods

TODAY, as critical alloying elements become scarce, all users of alloy steel are faced with the necessity of getting the most out of the steel they're receiving.

In most cases, this puts the problem squarely up to the heat-treater. Better heat-treatment methods can often do the job.

If you encounter difficulties, don't be too quick to blame the steel or the heating practice. The answer may be better *quenching* methods. More specifically, your problem might be solved with U·S·S Improved Heat Treatment — a superior quenching technique developed by United States Steel.

U·S·S Improved Heat Treatment extracts heat rapidly and *evenly* from every part of the material's surface. This treatment assures accurate timing, allowing removal of the material from the quenching bath while a certain amount of residual heat is present. Elapsed time from quench to tempering treatment is held to an absolute minimum. This not only improves mechanical properties; it also reduces cracking. And, this quenching method improves machinability by minimizing the formation of free ferrite in hypo-eutectoid steels.

The use of this quenching process is available to you without charge.

United States Steel does not manufacture or sell heat-treating equipment, but our metallurgists will be glad to analyze your heat-treating methods and make suggestions that may give you more uniform hardness, less rejects and less retreatment.

UNITED STATES STEEL COMPANY, PITTSBURGH
COLUMBIA STEEL COMPANY, SAN FRANCISCO
TENNESSEE COAL, IRON & RAILROAD COMPANY, BIRMINGHAM
UNITED STATES STEEL SUPPLY COMPANY
WAREHOUSE DISTRIBUTORS, COAST-TO-COAST
UNITED STATES STEEL EXPORT COMPANY, NEW YORK

Comments on U·S·S Improved Heat Treatment

by Mr. R. E. Christin, Chief Metallurgist
Columbus Bolt & Forging Co., Columbus, Ohio

"Quenching is a process often neglected in heat treatment. We feel it is just as important (if not *more* important) than any other phase of heat treatment. There is a tendency to concentrate too much on the heating—and lay too much blame for failure to the heating—when proper quenching could produce the objectives desired. Heating, even in the ideal environment, can be inadequate if quenching is faulty.

"Before we installed U·S·S Improved Heat Treatment, we occasionally encountered hardness variations in the as-quenched condition. These variations were loosely attributed to either the steel, or the heating or the quenching. However, after adopting the U·S·S agitated quench process, these hardness variations were practically eliminated, obviously indicating that conventional quenching was the chief cause of the hardness variations.

"After seven years' experience with U·S·S Improved Heat Treatment, we are convinced that this method is the answer to most hardening problems."

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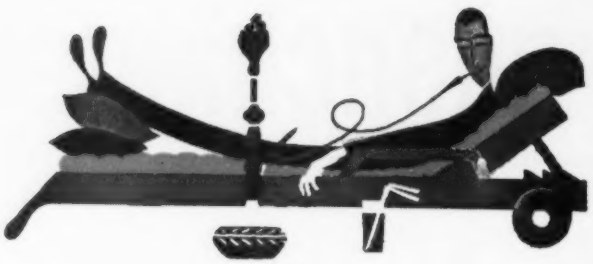

Fatigue Cracks

by Charles T. Post

International Intelligence

General Motors Overseas Operations Div. has so much to talk about to its offices in all parts of the world that it has a communications system devoted entirely to inter-office messages. Most of the messages concern trucks and automobiles, so it is no wonder that communications was thrown into an uproar when the following terse message came through from Buenos Aires the other day, addressed to a New York executive:

MRS. GEORGE S. SMITH, WAIST 24, BUST 34, HIPS 35. WHAT MORE DO YOU NEED TO KNOW?

The story finally came out that the wife of one of the Buenos Aires officials (whose name and measurements given above are fictitious) had become homesick for New York fashions. When hubby asked one of his colleagues in New York to pick up a few dresses for her, the New Yorker asked for measurements. Not one to waste words in a cablegram, the Buenos Aires man was brief and to the point.

Dial for Survival

To Monarch Aluminum Co., Cleveland, goes credit for one of the most unique approaches to the problem of the atomic bomb. Monarch is distributing a cardboard wheel-type chart on which you can dial almost any question with regard to getting ready for the Bomb and what to do after it hits. Presumably the idea is that you will study the chart carefully, then hang it on the wall within easy reach when the evil day comes . . . although it won't help much if ground zero is within a mile. It's going to be frustrating if we're riding in a taxi at the other end of town to think of that chart hanging on the wall back in the office.

Public Relations Note

Editors are human. It was no surprise when our secret agent turned up a report that a big proportion of the articles being scheduled by your f.f.j. these days originate with firms whose offices are air conditioned. If the news is hot, the editors will, of course, visit a firm whose offices are likewise, but they're rather cool to the idea of it.

Puzzlers

Farmer Jones in last week's puzzler had one horse, three cows and five pigs.

The solution to the monkey problem proved to be quite simple. Because the monkey's mother was 2½ years old the monkey weighed 2½ lb and the weight weighed 3¾ lb (which was the weight of the rope which weighed 4 oz per foot) so the rope was 15 ft long. C. E. Norton, Chicago; C. E. Blass, Talon, Inc.; R. W. Huff, Canton, Ohio; L. E. Hill, Lakeland, Fla., and C. H. Goff, Barber-Colman Co., untangled this one.

L. F. Calzi, Philadelphia, poses this one. The sides and height of a triangle are four consecutive integers. What is the area of the triangle?

machine tool high spots

sales inquiries and production

by W.A.Lloyd

Called Back—The Congressional ban on rollbacks for the July period of the controls act extension put machine tool industry prices back to the point where they had started 6 months ago. Supplementary Reg. 2 to CPR 30 scheduled to take effect on July 2 went down the drain.

Reaction of the industry ranged from one pole to the other. Some industrialists forever opposed to the principle of controls had some quiet cheers for Congress. But they still were confused. Others threw up their hands and began scrapping ambitious plans to get started on subcontracting — the only avenue along which the industry can experience a sharp advance in production.

Waiting for Wilson—By and large the industry is not distressed. Industry spokesmen have been opposed to the principle of price rollbacks from the start, as they are not workable in the case of machine tools and other products where long-term forward buying is standard practice.

Next move would appear to be up to Defense Mobilizer Charles E. Wilson, who probably knows as well as anybody that something has to be done to "get the industry off the spot."

The rumor is that Mr. Wilson will sign a machine tool order this week or early next week which will set the pattern for the machine tool industry and other related industries as well.

Off Schedule — Quick action is badly needed. The industry by Washington estimates is 20 pct behind schedule. A task force spent from January to July trying to obtain a satisfactory solution to the price situation, which was nullified the same week it was issued.

Expensive Subcontracting—Machine tool companies are running out of money. And the only way an industry can accumulate some money is by making a profit. Some machine tool companies at the present time are having machines built by subcontractors at a cost greater than the price at which they can sell them.

A few companies filed under CPR 30 and these may go ahead and add to their ceilings the Supplementary Reg. 2 allowances granted for increased overtime, shift-differential pay and subcontracting needed to meet defense orders. But the bulk of the industry was still pricing under GCPR and are still on the fence.

Shadow Plants — There's a lot of talk reported in Washington about the construction of government-owned plants, which in theory would be staffed in part with personnel from privately-owned plants.

The government plants would operate only in wartime, or in national emergency. Their peacetime function would be as standby capacity of shadow plants. Nobody in the industry is taking this too seriously, however.

CMP Changeover — Interim relief programs to help producers of machine tools, farm machinery and specified components were expected to be canceled by National Production Authority as soon as individual manufacturers received their third quarter CMP allotments.

Three orders, M-61 for machine tools, M-60 for components and M-55A for farm machinery were rescinded since "the need for these special aid programs was ended with the changeover to the Controlled Materials Plan July 1."

Tool and Die Study—Effects of price, wage and materials controls on industry were being scanned by Office of Defense Mobilization through reports by defense agencies who were making pilot studies of the tool and die industry. The Wage Stabilization Board received demands for relief from wage controls from many small tool and die employers who were "unable to compete with large industries in the skilled labor market."

The Defense Manpower Administration also reported increasing skilled labor shortages, particularly in the tool and die field.

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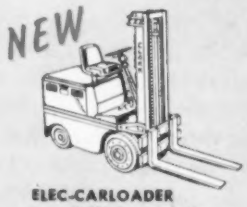

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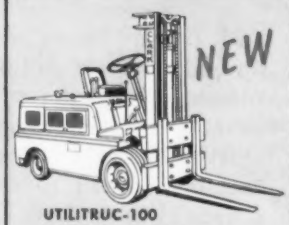

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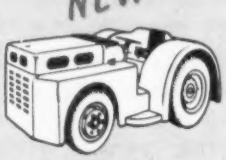

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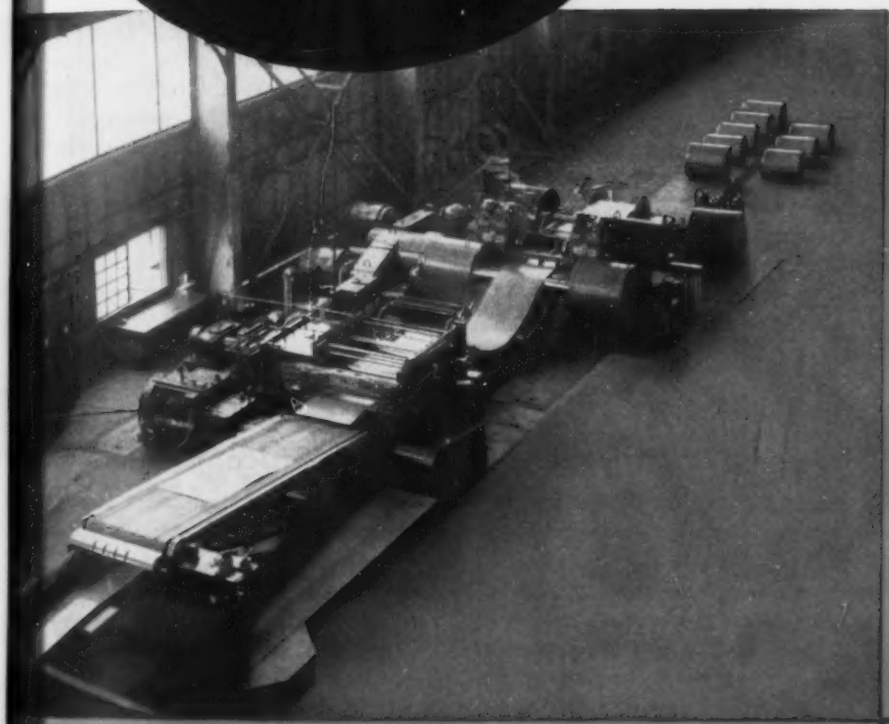

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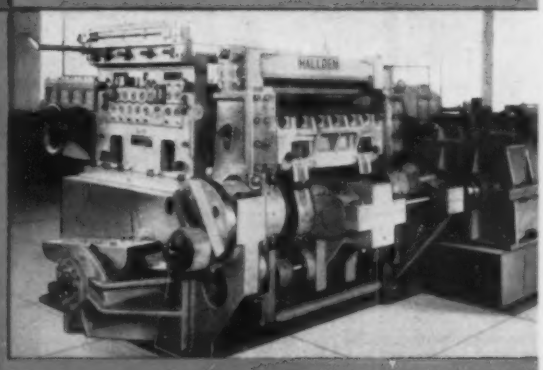
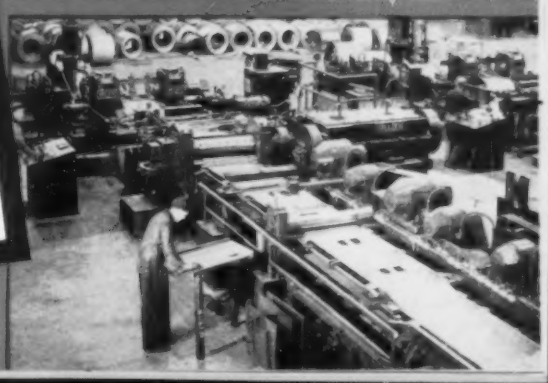
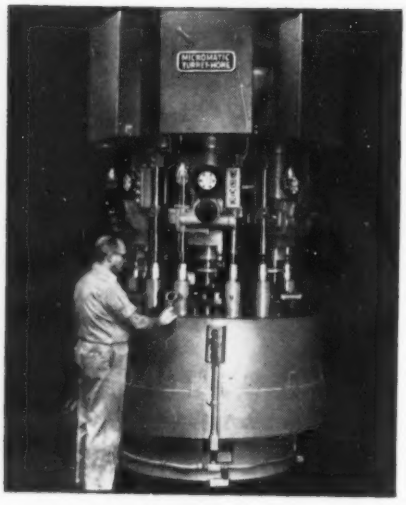




THE WEAN ENGINEERING CO., INC.
WARREN, OHIO

NEW *equipment*

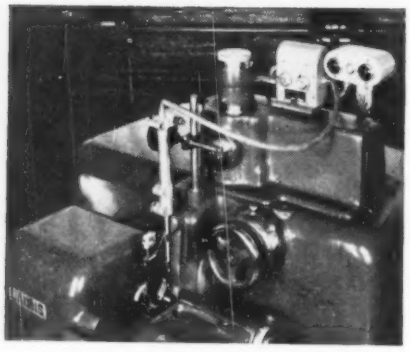
new and improved production ideas, equipment, services and methods described here offer production economies . . . fill in and mail postcard on the opposite page.



Honing unit features high precision, high production

To generate accuracy by honing and to hold precise tolerances in short-length bores up to 4 in. diam x less than 2½ in. long, a new type basic honing unit is available in single spindle machines, or for higher production four or six units are mounted on a rotating base in several models called Turret-Hones. The operator of the latter stands in one location to load and unload work as the spindles pass his station. The machine rotates continually at 2 rpm. These new honers feature adjustable mechanical stroke, manual or hydraulically controlled expansion of abrasive members, positive size control, rigid alignment of fixtures with the head to hold bore axis square with face of work, and safety controls. They are designed in accordance with J.I.C. standards. A single motor, mounted on the spindle housing, powers both rotation and reciprocation motions of the tool. *Micromatic Hone Corp.*

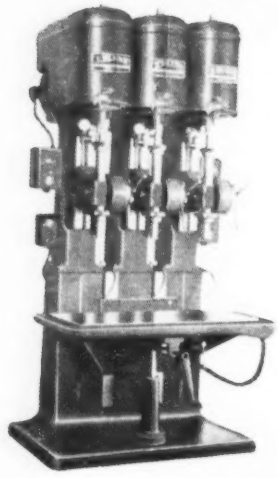
For more data insert No. 1 on postcard.



Gage sizes and trips operation on cylindrical grinders

A pneumatic gaging device for use on external cylindrical grinders stops the machining operation when diameter of the machined part reaches a predetermined value. When adapted to a non-automatic grinder a green light snaps off when machined part gets near to final dimensions, and a red one comes on when final dimensions are reached. On an automatic machine, stopping is in two successive steps through electro-valves coupled to the signal lights. The Etamic gage may be used for longitudinal and down traverse grinding as well. The device is available on Landis Tool Co. grinders if the customer so specifies. *Ateliers de Normandie.*

For more data insert No. 2 on postcard.



Drilling, tapping machines provide wide speed selection

Designed and built under actual tool room and production test conditions, Edlund Model 2F machines have a wide selection of speeds in drilling and tapping. An infinitely variable speed drive allows the operator to select the correct speed, within a broad range, for maximum tool life and greatest production. Speed changes are effected instantly by a handle controlled mechanism and an indicating dial shows the speed selected. Spindle speed ranges from 200 to 2700 rpm are standard; additional speeds from 50 to 675 rpm are obtained with back gears. Capacity is ¾ in. in steel (1 in. with back gears); ⅞ in. in cast iron (1¼ in. with back gears). Additional equipment includes semi-automatic power feed that automatically engages as the drill touches the work; a reversing motor tapper capable of tapping 30 holes per min and reversing at the same depth within ¼ turn of the tap. *Edlund Machinery Co.*

For more data insert No. 3 on postcard.

Turn to Page 38

FREE *publications*

These publications describe money-saving equipment and services... they are free with no obligation... just fill in and mail the postcard.

Corrosion control

Characteristics, properties, uses and methods of applying synthetic rubber resin-based coatings are explained in a new brochure. Machinery enamels, damp-wall enamels, stucco-masonry coatings and scuff-free floor finishes, formulated for maximum resistance to corrosion or erosion are discussed. *Casey & Case Coating Co.*

For free copy insert No. 29 on postcard.

Power screw drivers

Advantages and application of power screw drivers are presented in a new 12-p. booklet. Less wasted time, elimination of lost screws and operator fatigue, and fewer damaged products are possible with use of the new Shakeproof power screw drivers. Typical applications and full description of operating mechanisms are detailed. *Shakeproof, Inc.*

For free copy insert No. 30 on postcard.

Carbide die sections

A new technical data publication covering the use of sintered carbide in blanking dies has been issued. The 16-p. booklet, *Diecarb—Grades, Applications, Design and Maintenance*, is available to die users, designers and fabricators. The die designer will find in this booklet useful information and formulae for computing the physical requirements of sintered carbides used for die sections. New standard Diecarb sections are listed for punches, perforators, bushings and rectangular sections. *Firth Sterling Steel & Carbide Corp.*

For free copy insert No. 31 on postcard.

Steam spraying

A revolutionary new process which uses superheated steam in place of compressed air to apply high viscosity finishing materials is the subject of a new 12-p. booklet. The method permits application of films ranging to 2 mils in thickness with one pass of the gun. *Kellogg Div., American Brake Shoe Co.*

For free copy insert No. 32 on postcard.

Phosphating cleaner

Development of Phoscote 115, a dual purpose compound which will both clean and phosphate in a single operation, is described in a new bulletin. The compound produces a phosphate coating of 50 to 100 mg per square foot on steel in approximately 1 min at 165 to 180°F. *Pelron Corp.*

For free copy insert No. 33 on postcard.

Turn to Page 146

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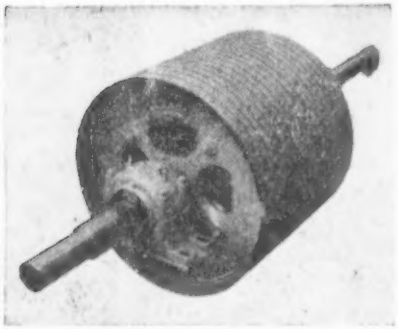
new equipment

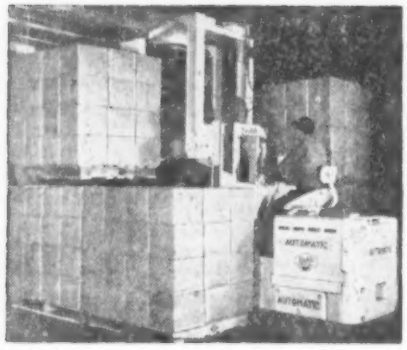
Continued



Huge magnetic pulley extracts tramp iron from ore

This electro-magnetic pulley, measuring 59 in. diam x 52 in. wide, serves in a mine as the terminal head pulley of a main conveyer system running at half mile centers and traveling at 256 fpm, handling 700 to 800 tons of tin ore per hr. Weighing 12 tons, the pulley will extract tramp iron in the form of picks, shovels, cutter teeth and short lengths of mine railway line, from the ore prior to crushing. It is mounted on two main, and two auxiliary roller bearing plummer blocks, the shaft being 16 ft long x 8½ in. diam. *Rapid Magnetic Machines, Ltd.*

For more data insert No. 4 on postcard.



Side loading fork truck can work in 6-ft aisles

A fork truck that stacks to either side while parked lengthwise in the aisle has been developed to cut down the space needed for mechanized materials handling. Instead of the truck facing perpendicular to the aisles, it turns its forks 90° to left or right, lifts normally, and positions the pallet with an in-out mechanism. A rotary action turns the forks, and a scissors type expanding motion then pushes them out as much as 54 in. Pallet loads weighing to 2500 lb and measuring 48x48 in. can be handled. The entire arrangement can be operated by the truck's hydraulic system. *Automatic Transportation Co.*

For more data insert No. 5 on postcard.

Lubricating grease

Non-melting grease for hot-spot lubrication has been developed for use on plain or anti-friction bearings where "cling" and lubricity of the lubricant should be maintained despite high operating temperatures. Kantmelt, as the name implies, does not melt; it is a synthetic grease, containing no metallic soaps, no fatty acids, no filler, no water, and no alkali. It is said to be completely stable under all conditions of service and storage. *Specialty Products Co.*

For more data insert No. 6 on postcard.

Industrial battery charger

A new industrial battery charger for units up to 55 amp-hr capacity operates on the selenium rectifier principle. It is designed to give simplified, maintenance-free operation, prolong battery life, and save power. An automatic controller governs the amount and time of charge. Only three simple steps are necessary: plug it in, set clocks, and throw switch. There are no moving parts to maintain. *Yale & Towne Mfg. Co.*

For more data insert No. 7 on postcard.

Turn to Page 40

use postcard below

Postcard valid for 8 weeks only. Information may be secured subsequently by separate letters fully describing each item wanted, including company name.

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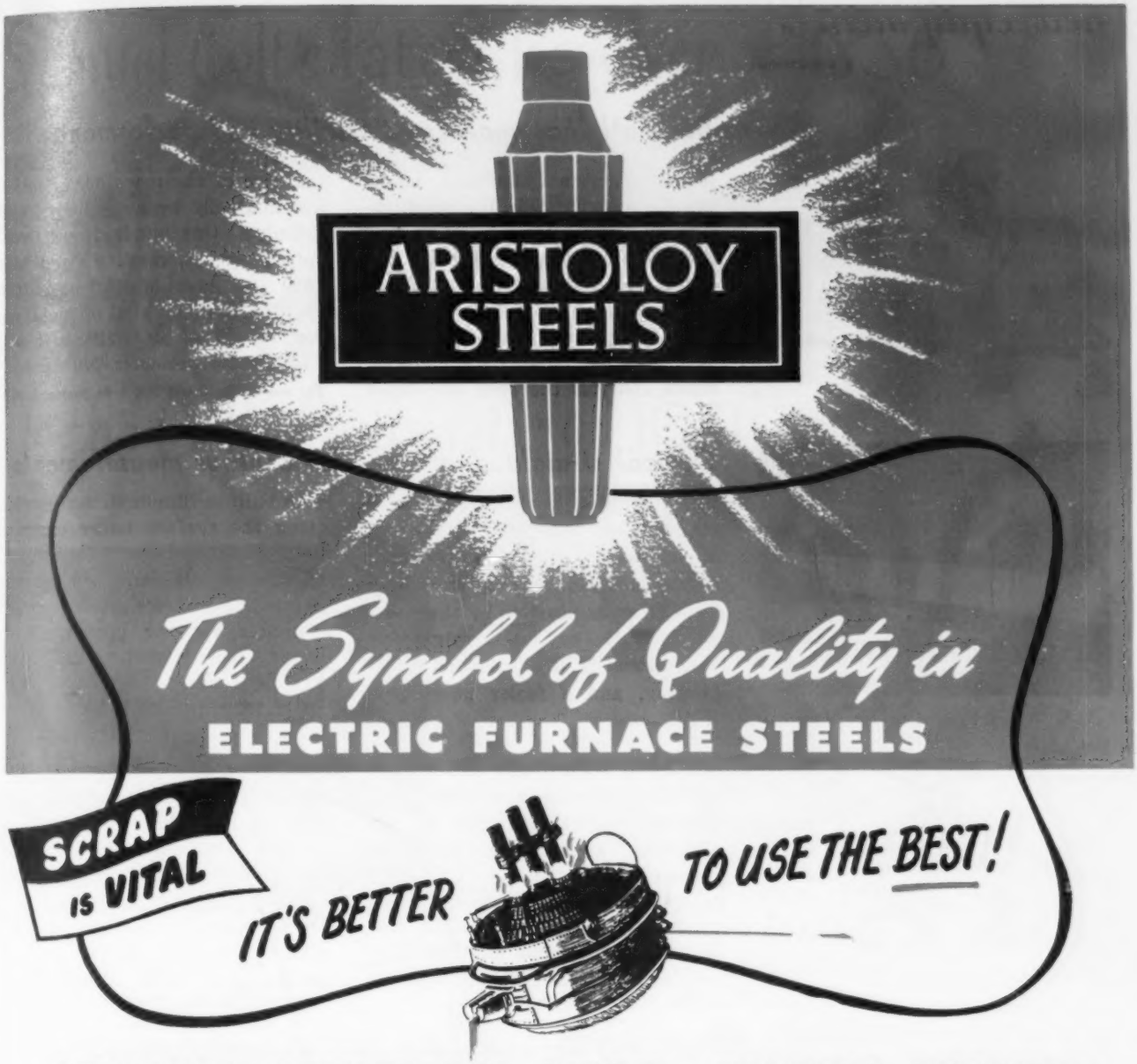

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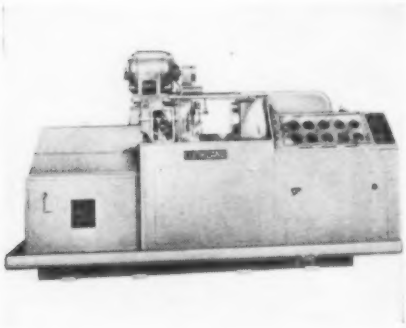
Houston 3, Texas

528 Fisher Building
Detroit, Michigan

3104 Smith Tower
Seattle, Washington

Monadnock Building
San Francisco 5, California



Dialmatic has improved flexibility and performance

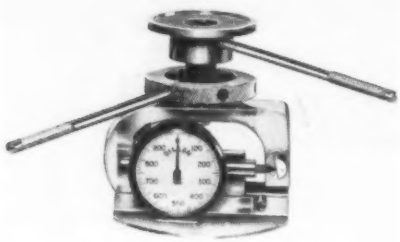
An improvement in this single spindle automatic is the substitution of a dynamatic coupling and a conventional feed motor for the motor generator set and a dc motor in the electric feed drive. The feed drive mechanism has been simplified. A disk type friction clutch, which controls the feed and rapid traverse of the machine, is shifted automatically by a small hydraulic cylinder. One hundred and twelve spindle speeds, ranging from 24 to 1820 rpm provide efficient cutting speeds for every kind of metal and for all types of cutting blades. *Cleveland Automatic Machine Co.*

For more data insert No. 8 on postcard, p. 37.

Optical straightedge simplifies contour measurements

By utilizing a beam of light as a straight-line reference deviations of supposedly flat surfaces, as small as ±0.00005 in. may be measured. This is made possible by the Griswold Huet optical straightedge which consists of a lense and prism housing, and a feeler microscope with built-in illumination that rides along the surface under examination. Errors, observed through the microscope, are indicated by relative position of two indices, and the distances between converted into linear measurement. *F. T. Griswold Mfg. Co.*

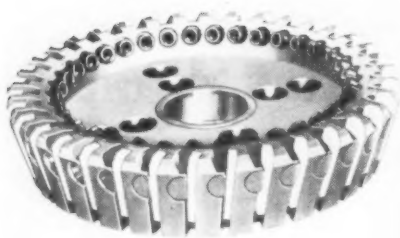
For more data insert No. 9 on postcard, p. 37.



Jacking assembly increases versatility of pressure gage

An accessory for the Dillon mechanical pressure gage is a jacking assembly, a carefully machined mechanism that makes it possible to apply compressive loads to the pressure gage in a straight line and with a minimum of effort. The jacking assembly consists of a finely threaded screw and large nut with equally spaced holes around the edges. Into these handles are screwed. They are the means of applying load to the gage. Different sizes and shapes are available. *W. C. Dillon & Co.*

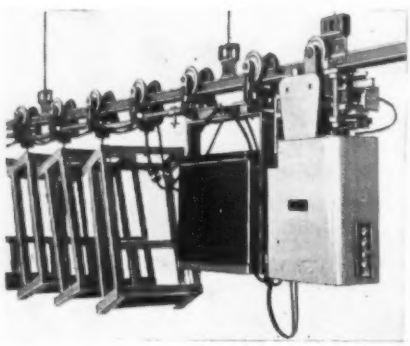
For more data insert No. 10 on postcard, p. 37.



Face mill has wedged-in solid Kennametal blades

Removal of cast iron at 60 to 70 ipm table travel is claimed for a simplified axial face mill. The mill has only four parts: body, blades, wedges, and nuts. Wedges and screws are one-piece high alloy steel, hardened and ground to close tolerances; they remain assembled to the cutter body at all times, reducing possibility of lost parts. Blades are heavy, solid, wedged-in. No hammers or tools are needed to tighten them; a hex wrench suffices. Blades are available in two styles, for cutting to a square shoulder or to 45° corner. *Kennametal, Inc.*

For more data insert No. 11 on postcard, p. 37.



Conveyer system is independent of outside power

Called Mono-Dyne, the new unit is battery powered, making it completely independent of any outside source of energy. The driving power is self-contained and travels along with the conveyer itself. By eliminating the need for complicated overhead wiring, the systems can be installed at considerable savings, and can be easily incorporated into present manually operated systems. The conveyer is capable of multi-speeds, forward and reverse, and is operated by pushbutton control or remote control, if desired. Mono-Dyne systems can be used within a building or between buildings. *Bloom System, Inc.*

For more data insert No. 12 on postcard, p. 37.

Turn to Page 126

Samuel Colt's Patent Revolver of 1836

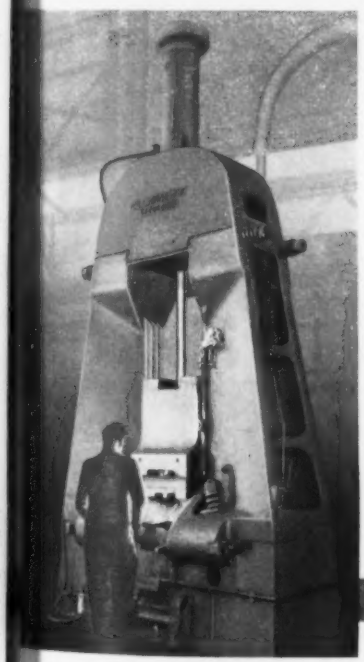
was **Forged**-

so is the Colt Automatic of 1951

(Right) Colt Commander Model .45 Caliber

(Left) Aluminum Alloy Drop Forging for Colt Commander

PHOTOS COURTESY COLT'S MFG. CO. AND DROP FORGING ASSOC.



WHEN Samuel Colt invented the revolver in 1836, he realized that any mechanism subjected to the shock of continuous firing must be made of forged steel...for only hammering—impact—could impart to metal the strength and toughness to withstand continued shock and stress.

In the great rearmament program now going on, the modern descendant of Samuel Colt's great invention—the automatic pistol—and thousands of other types of weapons rely on forgings to give them the resistance to shock, strain and stress that means superior fire power.

Forgings come first!

Although patented in 1836, Colt's revolver didn't get into real production until 1847 when the enterprising Eli Whitney turned out 1000 at his plant at Whitneyville, Conn. The new weapon was an immediate success in the Indian wars. One of the first records set by the new revolver was when 15 Texas Rangers armed with revolvers defeated 80 Comanche Indians, killing 42 of them.

•

CHAMBERSBURG ENGINEERING CO., Chambersburg, Pa.

CHAMBERSBURG

THE HAMMER BUILDERS

IRON AGE *introduces*

L. M. Forncrook, elected vice-president of the EDGEWATER STEEL CO., Pittsburgh. **H. C. Riddile**, made vice-president in charge of manufacturing; **B. T. Roe**, vice-president in charge of sales of the Tracy Div.; **L. L. Leape**, secretary; **H. H. Solof**, assistant to the president; and **B. J. Krywick**, general manager of the Tracy Div.

G. O. Loach, elected vice-president and director of ELECTRO METALLURGICAL CO. OF CANADA, LTD., Welland, Ont.

Wencel A. Neumann, Jr., elected vice-president of industrial sales; **H. G. Bauer**, vice-president of engineering; and **Charles A. Jurgensen**, vice-president of manufacturing, of the DE LAVAL STEAM TURBINE CO., Trenton, N. J.

Stevens H. Hammond, elected chairman of the board of WHITING CORP., Harvey, Ill.

C. Garritt Bunting, named secretary of the DETROIT STEEL PRODUCTS CO., Detroit.

I. Melville Stein, elected executive vice-president of LEEDS & NORTHRUP CO., Philadelphia.

A. E. McRae, appointed superintendent; **Arnold I. Hansen**, assistant superintendent; and **Edward C. Gerke**, inspection superintendent, of the gun plant of Oldsmobile Div. of GENERAL MOTORS CORP., Detroit. **Robert T. Rollis**, promoted to superintendent of the pressed metal and plating plant.

R. S. Cooper, elected president and **D. B. Huntting**, named chairman of the board of the E. HORTON & SON CO., Windsor Locks, Conn.

Lawrence L. Garber, elected vice-president of the H. K. PORTER CO., INC., Pittsburgh.

John P. Courtright, elected executive vice-president of the MARION POWER SHOVEL CO., Marion, Ohio.

Mel E. Mauer, appointed director of manufacturing operations for NESCO, INC., Chicago.

Martin J. Holleran, named assistant manager of tool steel sales for the CARPENTER STEEL CO., Reading, Pa.

C. R. Horton, Jr., appointed manager of the Engineering Development Dept. of the Engineering Works Div. of DRAVO CORP., Pittsburgh. **D. H. Marlin**, becomes Mr. Horton's assistant.

Raymond F. Duff, appointed sales manager of the PENNSYLVANIA STEEL CORP., Detroit.

Harold Evans, made vice-president in charge of operations of the OHIO RIVER STEEL CORP.

Forest H. Humphreys, named manager, property department of the AMERICAN CAR & FOUNDRY CO., New York.

Joe H. Ayres, appointed manager of pensions and insurance for ARMCO STEEL CORP., Middletown, Ohio. **E. L. Brooks**, named manager of personnel research; **George M. Hill**, staff supervisor of employment; **W. T. Maxwell**, staff supervisor of Armco Drainage & Metal Products, Inc. personal relations; and **C. M. Allen**, chief safety engineer.

Turn to Page 72

S. D. FLINN, appointed comptroller, U. S. Steel Supply Co., Chicago.

H. D. PALMER, elected president, Detroit Steel Products Co., Detroit.

EUGENE J. REARDON, made executive vice-president, Superior Steel Corp., Carnegie, Pa.

IRON AGE

salutes

Carl W. Meyers

A MAN to watch is Carl Meyers, chief of Colorado Fuel & Iron Corp. In these days of hectic decisions and much work many head men do not find enough time for personal contact with their key officials. That's not true of Carl.

This one-time rolling mill switchboy has built a reputation for being tough—but human. He's been through the mill, knows what must be done, knows how people feel. He says what he has to say; commends as well as condemns.

Recently, just before the press learned of C F & I buying an Eastern mill, Carl Meyers called the key people in to tell them the news. He wanted them to hear it from him first and straight from the shoulder.

He told them there would be no change as long as people were doing their best. He told them promotions would be from within the company—if the candidates were there.

Carl told them their new bosses were all for them and he opened the gates to suggestions or anything else that was on their minds. It was his first contact with these people.

It paid off because it was straight, tough and human. Carl is going to be personal about running this new steel empire and he has already made more friends than he knows—both in and out of the industry.

Carl's hobbies are his home and boating. He's a family man and takes great pride in the gardens of his home at Madison-on-the-lake, Madison, Ohio.

IRON AGE *introduces*

Continued

JAMES P. STEWART, elected president, De Laval Steam Turbine Co., Trenton, N. J.

ARTHUR J. WILLIAMSON, made vice-president in charge of manufacturing operations, Tube Reducing Corp., Wallington, N. J.

F. S. KOHL, made operation manager, Fitchburg Turbine Div., General Electric Co., Schenectady.

CHARLES P. HARLOW, made sales manager, Hardware Products Dept., Wickwire Spencer Steel Div., Colorado Fuel & Iron Corp., Denver.

Clarence Zener, appointed associate director of the Research Laboratories of WESTINGHOUSE ELECTRIC CORP., Pittsburgh.

James J. Morris, appointed industrial sales representative for New England, upper New York State and Pennsylvania for the Stamford Div. of the YALE & TOWNE MFG. CO., Stamford, Conn. **Harold W. Treat,** named industrial sales representative for metropolitan New York City and New Jersey.

Robert M. Lundgren, appointed vice-president of the KULJIAN CORP.

Claude O'Maley, elected vice-president in charge of manufacture at Richmond, Ind. plant of the MOTO-MOWER CO., Detroit. **John S. Slick,** named vice-president in charge of operations and comptroller; and **Renville Wheat,** vice-president, secretary and legal counsel.

F. S. Goold, elected vice-president in charge of production of the DOUBLE SEAL RING CO., Fort Worth, Tex. **R. W. Hoyt,** named vice-president and chief engineer; **Buyrl Wilson,** vice-president in charge of sales; **D. L. Doherty,** special assistant to the vice-president and secretary-treasurer; and **Fran Schmale,** assistant to vice-president and chief engineer.

William J. Halliday, appointed general sales manager of the Waterbury Factory Div. of the PLUME & ATWOOD MFG. CO., Waterbury, Conn., succeeding James J. Monaghan, who resigned. **Paul R. Curtis,** made sales manager, Cosmetic Div.; and **Walter M. Matthews,** sales manager, Industrial Div.

Ramon S. Cram, named advertising and sales promotion manager of INGALLS IRON WORKS CO., Birmingham.

Arthur F. Vinson, appointed manager of employee and community relations of the Small Apparatus Divs. of GENERAL ELECTRIC CO., Schenectady. **Clayton S. Coggeshall,** named assistant to the manager and **Robert S. Neblett,** manager of sales, for the Turbine Divs. **Paul M. Deal,** made assistant accountant of the Fractional Horsepower Motor Divs.

HOWARD J. DAVIS, made assistant to executive vice-president, Colorado Fuel & Iron Corp., Denver.

James C. Kroon, elected vice-president of TOLEDO PICKLING & STEEL SERVICE, INC., Toledo. **Bernard Heinle,** becomes sales manager.

John Fletcher, joined staff of ARTHUR D. LITTLE, INC., Cambridge, Mass.

Ervin J. Baumrucker, named assistant sales manager of the CLEARING MACHINE CORP., Chicago. **M. E. Peterson,** takes over management of the Joliet, Ill., plant and **Charles Kauderer** will be in charge of the Detroit office.

Jordan D. Wood, appointed public relations manager of JONES & LAMSON MACHINE CO., Springfield, Vt.

Arthur J. Archibald, appointed purchasing agent for JENKINS BROS., LTD., Montreal.

Otto von Perbandt, appointed Ohio representative for BIGELOW-LIPTAK CORP., Detroit.

Thomas C. Fogarty, elected to board of directors of CONTINENTAL CAN CO., New York, succeeding Sidney J. Steele, who resigned.

OBITUARIES

Joseph Giordano, president of Giordano Waste Material Co., Camden, N. J.

Cecil E. Bates, president of the Ironton Fire Brick Co., Ironton, Ohio.

William D. Falkenstein, Pittsburgh district manager of Electric Controller & Mfg. Co., Cleveland.

Robert Levison, 47, associated with the Bauer Machinery Co., Philadelphia.

WELDING HERCULOY *plates into a hot water storage generator for the new Veterans' Hospital in Boston.*

ROLLING HERCULOY *plates into cylindrical form for the tanks. Photos from The Patterson-Kelley Co., Inc., East Stroudsburg, Pa.*

Once Again— HERCULOY is Chosen for Hot Water Storage Generators

HERCULOY is Revere's Copper-Silicon Bronze, which has the corrosion resistance of copper plus the strength of mild steel. It is therefore ideal for hot water tanks, among many other applications. Much has gone into domestic water heaters, but these are far outstripped in size by a number of large tanks fabricated of Herculoy by The Patterson-Kelley Co., Inc., East Stroudsburg, Pa., for the new Veterans' Hospital in Boston. The water is heated by steam passing through bundles of Revere Phosphorized Copper Tube. Inlet and outlet flanges are Herculoy, made from heavy gauge extruded shells, which offer economies over the alternative method of cupping them out of plate.

Patterson-Kelley weld all these large storage heaters, using Heliarc. Easy weldability is another important quality of Herculoy. Golden beauty is also a feature, and the size and beauty of these tanks created a great deal of comment while they were being trucked to the hospital. . . . Remember Herculoy's qualities: corrosion resistance of copper, strength of mild steel, easy weldability and formability, and beauty. Remember other applications besides tanks, such as: vats, screens, filters, ducts, fire extinguishers, chemical and marine construction.

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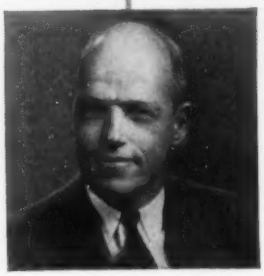
on the assembly line

automotive news and opinions

Pressure is on to complete high compression engine programs . . . K-F gets damages for Otis' default on stock sale.



by Walter G. Patton

More Considerations—Gasoline economy is only one factor involved in the new high compression engine programs initiated originally by Cadillac and Oldsmobile and undertaken more recently by Chrysler, Studebaker, Buick and Ford. Other considerations are (1) competitive position, (2) the difficulty of installing a long straight 8 and a short V-8, in the *same* basic body shell. This is particularly a GM problem.

Competitive Gain—With its 180 hp engine, Chrysler has been able to make a substantial gain competitively. Latest reports indicate shipments of Chrysler 8-cylinder cars set a new sales record during June. A total of 8,699 V-8 fire power units were shipped to dealers, exceeding by nearly 60 pct the highest single month during 1950. Shipments were 27 pct above the previous all-time high set in May, 1951.

With its domed high compression chamber, Chrysler is presently setting the pace for other car makers. By shaping the combustion chamber, designers not only use larger valves but are better able to control the burning rate of fuel. The element of controlled turbulence may also be introduced through combustion chamber design.

Use German Designs—Some of the ideas being used in the latest-type passenger car combustion chambers are based on German designs. Of course, many U. S. developments have been added. The German Maybach 60° V-12 engine manufactured in 1943 had a cast iron cylinder head of domed construction with two valves per cylinder. The intake valve had a throat diameter of 2½ in. Diameter of the exhaust valve was 2 in. The Germans used very short guides and both intake and exhaust seats were at 45°. The piston was cut out slightly to permit clearance for the valves. The Auburn V-12 built earlier in this country also had an angled cavity with the valves coming in almost vertically to the center line of the bore.

K-F Wins Damages—Federal Judge John W. Clancy has awarded Kaiser-Frazer $2,588,979 in damages against the Cleveland banking firm of Otis & Co. for breach of contract. K-F originally sued Otis for $19,276,000 but reduced its claim to $4 million.

The lawsuit grew out of Otis' failure to underwrite a $10 million K-F stock issue in 1948. The stock was being sold to increase K-F's production from 1,000 to 1,500 cars per day.

Judge Clancy ruled Otis had instigated a last minute suit, filed by a former employee, in order to void the K-F contract. The court's decision rules Otis committed "an outright breach of contract."

Otis has announced it will appeal the court's decision. In order to do so the firm must first put up a bond for twice the amount of the judgment.

Production Cutbacks—Automobile production schedules are expected to decline sharply during July. The cutbacks will not fall evenly across the board. GM and Ford will probably stay within 10 to 15 pct of the June production level. The Chrysler cut will probably exceed 20 pct. Independents will attempt to hold the June line.

The combination of tight materials, vacations and, in some instances, labor trouble will probably hold output well below the June total. Plant-wide vacations are a problem at this time of year, particularly for vendors of the industry who find it difficult to anticipate the part shortages that inevitably result when an entire plant shuts down.

Expanding Market—Automobile haulaway firms are expanding their market again. One firm has converted its haulaways into combination automobile-grain carriers on trips from Iowa. The change has been accomplished by equipping the carriers with steel bottoms.

During World War II automobile haulaway trucks carried planes, fuselages, wings, tail assembles,

assembly line

Continued

gun carriages, light tanks, etc. More than 3,000 transport trailers were converted into buses. About two-thirds of all passenger cars and trucks shipped from automotive factories are transported by haulaway trucks.

Time May Come—The break-even point has not yet been reached but the time is not too far off when, because of greatly reduced volume, it will cost an automobile manufacturer about the same to produce a synchromesh transmission as it will cost to build an automatic transmission. The automatic drive unit is inherently more expensive. It has more parts. It requires greater precision in manufacture. However, with volume greatly reduced, synchromesh will undoubtedly become a high cost job, notwithstanding a sizable volume for replacement.

The time table for automatic drive has been slowed down by the limitation on aluminum. However, any easing of aluminum restrictions is expected to send the production of automatic transmissions soaring almost immediately.

Changes in automobile production schedules in favor of lighter cars will be noticeable although limited. Studebaker is instituting an increase in the ratio of Champions. Nash will undoubtedly step up the schedule of Ramblers. GM and Chrysler have only a limited opportunity to make change without running into tough opposition from their several divisions.

Average Auto Weight Higher—Car stylists and designers have had a far-reaching effect on the materials situation in this country. Analysis of motor car weights emphasizes this point. Between 1930 and 1950 average weight of 29 U. S. cars increased from 3,500 to 3,750 lb. During the same period the largest cars were reduced 1,000 lb in weight while the small cars added 500 lb.

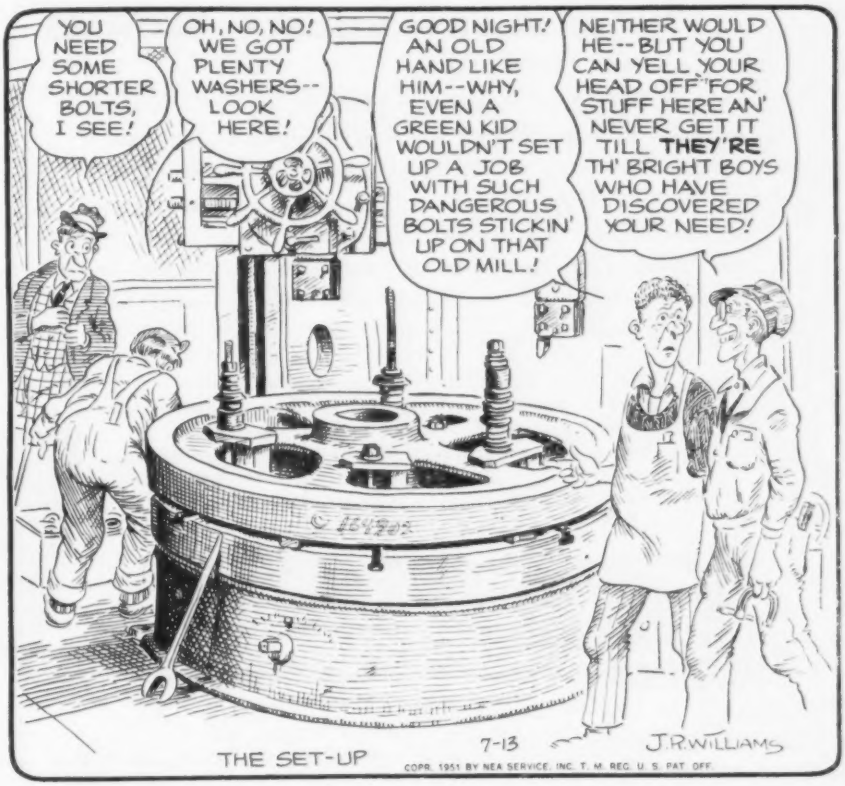
Tool Deliveries Lagging—The machine tool situation is tight. Deliveries of most types of machine tools have been falling anywhere from 30 to 90 days behind promises. Scarcity of skilled labor, poor deliveries of materials and electrical parts and the growing volume of defense orders have contributed to the delays.

Will "Tool Around"—As far as can be learned, tooling for each of the automobile high compression engine programs that is likely to be undertaken at this time has now been placed. No car manufacturer is giving up, although most of the programs are proceeding under great difficulty. Where high production equipment is either shelved or unavailable, it is expected that efforts will be made to "tool around" these machines. The cost will be high—but so is the determination of the car builders to complete the programs in which they have already invested millions of dollars.

Drill Penetration Doubled—Carbide-tipped twist drills are finding an important place in transfer machines drilling cast iron. Reports indicate the rate of drill penetration can be doubled and still obtain three to four times the life of an untipped drill. When operated at the same speed as steel twist drills, the tipped drills give as much as 10 times the tool life of high speed steel.

Ahead of Schedule—Construction of the million sq ft Chrysler-Delaware tank plant is running 30 days ahead of schedule. Chrysler has appointed John E. Brennan, chief production engineer of the Dodge-Chicago Aircraft Engine Plant during World War II, as production manager of the new Chrysler jet engine plant. Specific location of the Macomb County plant has not been announced. The Navy will acquire the land and the plant will be government-owned. It will comprise 1.6 million sq ft and will employ about 6,000 people. The Chrysler contract to be built, equip and operate the new plant totals $91 million.

THE BULL OF THE WOODS — By J. R. Williams


YOU NEED SOME SHORTER BOLTS, I SEE!
OH, NO, NO! WE GOT PLENTY WASHERS--LOOK HERE!
GOOD NIGHT! AN OLD HAND LIKE HIM--WHY, EVEN A GREEN KID WOULDN'T SET UP A JOB WITH SUCH DANGEROUS BOLTS STICKIN' UP ON THAT OLD MILL!
NEITHER WOULD HE--BUT YOU CAN YELL YOUR HEAD OFF FOR STUFF HERE AN' NEVER GET IT TILL THEY'RE TH' BRIGHT BOYS WHO HAVE DISCOVERED YOUR NEED!
7-13
J.R.WILLIAMS
THE SET-UP
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F·E·I

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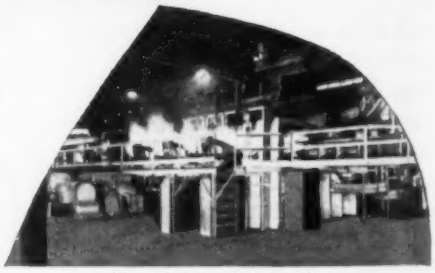
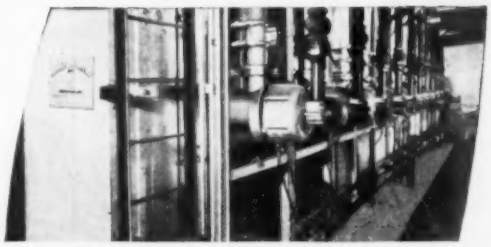
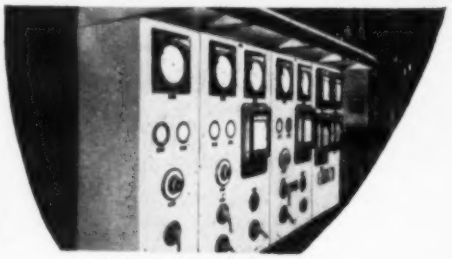


View of slab entrance end.



Side view showing patented Burners.



Instrument panel of automatic controls.

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8

west coast progress report

digest of far west industrial activity

by R.T.Reinhardt

Still to be Built — Award of a certificate of necessity to Kaiser Steel Corp. covering fast write off of $55 million for a third blast furnace at Fontana, Calif. is no guarantee that the stack will be built.

Although there is a lack of metallics in the West and Kaiser Steel has long sought additional iron production facilities, the entire project is now being reviewed by company officials. Best guess in the trade is that the third furnace will eventually be built both as a source of iron for Kaiser's eight open hearths and a potential source of merchant iron. Ore reserves are another important factor.

Scrap Scraping — Kaiser has thus far been able to operate at well above rated ingot capacity but has had to go far afield for scrap. Mexico and other distant points have been tapped. Last month the company purchased six destroyer escort vessels which will yield about 5000 tons of scrap. Dependence upon local scrap drives wouldn't permit continued high operating rates.

Shipbuilding Talk — Persistent rumors that either the Henry J. Kaiser interests or Bethlehem Pacific Coast Steel Corp., shipbuilding division, will be awarded a contract for five Mariner Class ships to be built on the West Coast lack any substantiation locally. Bechtel Corp. is mentioned here as often as either of the other two. Bechetel was prominent in tanker building during the last war. Only legitimate reasons for western shipbuilding at this time are maintenance of skills and activation of yards. Costs remain out of line.

Import Machine Tools—French-made machine tools arrived in Los Angeles last week on orders from Perrish Steel Products, Inc. Initial shipment was termed a "sample delivery" by the importers. Included were vertical and radical drills, milling machines and centerless grinders, products of Association Francaise de Constructeurs de Machines Outils and Alliance de Constructeurs de Machines Outils. Reports indicate delivery dates are in many cases better than similar U. S. made tools and prices are competitive.

Squeezing Out Plane Parts — Lockheed Aircraft Corp. at Burbank, Calif., is using the same technique which produces tooth paste tubes to fabricate aluminum airplane parts. Material and manpower economies are said to run as high as 75 pct.

Experiments and production experience encouraged engineers to design a 1000-ton impact extrusion press said to be the largest in the industry which will be in operation this summer. Making parts in this press instead of conventional machining will save the company approximately $52,000 per year.

Lockheed expected delivery of its 8000 lb pressure metal-forming press last week. This unit weighs as much as nine army tanks and is capable of producing wing sections and other parts in solid pieces as large as 10 x 30 ft. Cost, $750,000.

More Light Metal — Two announcements last month indicate increased western production of aluminum. Plans of Aluminum Co. of Canada, which have been brewing for the past three years, apparently are maturing. Kitimat Construction Co. of Canada is starting work on a townsite and preliminary work involving from $50 million to $175 million in British Columbia as the first step in what may eventually be a $550 million aluminum reduction project. The area is about 450 miles north of Vancouver where the world's largest privately financed power development is slated for construction.

On a smaller scale: Reynolds Metals Co. is planning a $12 million expansion of its facility at Longview, Wash. Pots will be increased in size to a total capacity of about 60,000 tons per year as against the present 37,500 tons of the three pot lines.

MORE PIECES . . . LESS COST

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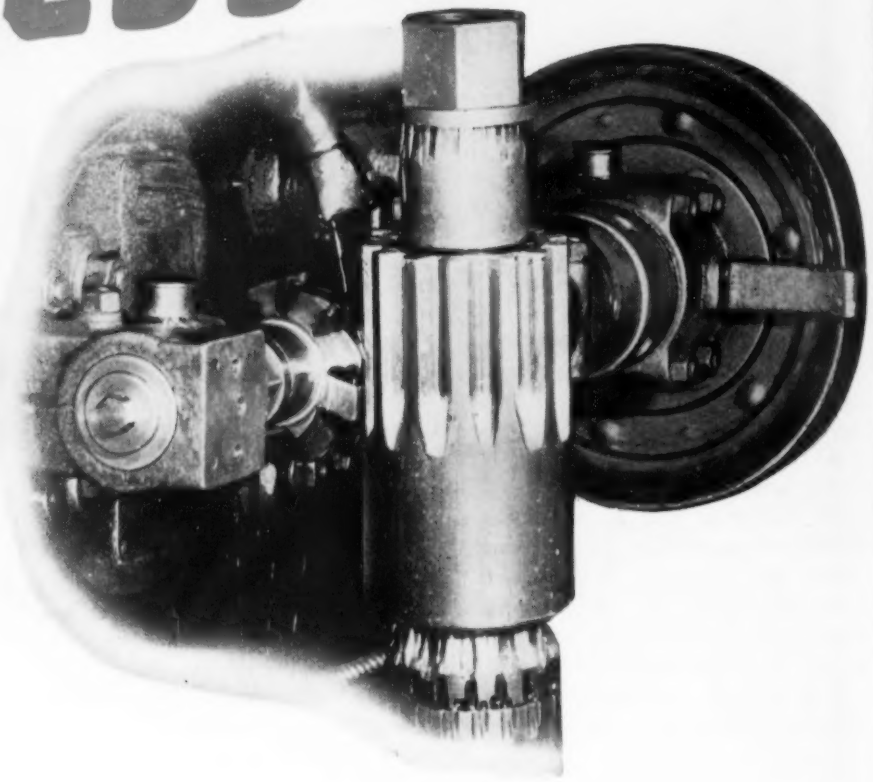

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★★PRODUCTION GOES UP. Whether cutting or grinding, Texaco cutting fluids both lubricate and cool, eliminate chip welding or wheel loading. You can thus increase speed and feed for greater output, lower unit costs.

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TEXACO

TEXACO CUTTING, GRINDING AND SOLUBLE OILS FOR FASTER MACHINING

the federal view

this week in washington

by George H. Baker

Truce Slows Planning—Korean truce-talk is building up a new "wait-and-see" attitude in Congress toward renewal of the Defense Production Act.

Despite the sincere and honest pleading for extension of controls from men of the caliber of Defense Mobilizer Wilson, Congress shrugs and points to "truce" headlines in daily newspapers.

Many members of both political parties stoutly maintain that voters "just don't give a damn" whether the entire program of price, wage, and materials controls is extended or not.

Controls in War and Peace—Chairman Spence, D., Ky., of the House Banking Committee complains bitterly "it takes a Pearl Harbor to arouse the people, but it takes very little to lull them asleep."

On the other hand, Rep. Wolcott, R., Mich., comments that controls were enacted last year on the basis of the Korean war. "Now we are told that because we may have peace in Korea, we must have controls," Wolcott observes. "Strange goings-on," he summarizes.

Tool-Builders' Plight—At OPS, officials continue to struggle with the problem of how to permit machine-tool builders to pass on their mounting cost increases. The agency says "very few" tool manufacturers availed themselves of last month's opportunity to begin pricing under CPR 30. Nearly all of them are now "stuck" with last January's general-freeze order, while costs continue to climb dangerously close to fixed selling prices. "We're trying to do something for the machine-tool industry," harried price officials promise. Their dilemma: Congressional ban against roll-backs on one hand; feeling that straight price increases would render machinery price control meaningless on the other.

Many OPS officials express the uneasy feeling that their days in Washington are numbered. "You can't even get hold a congressman these days," one of them laments. "They're all huddled around the news-tickers in the cloak-rooms reading Korean truce bulletins."

Stockpile Sights Raised—International tension over the past year has jolted the planning agencies into more than doubling the originals goals for adequate national stockpile.

New rate of procurement will depend to a large extent on outcome of the Korean war and developments in the Far East. Should the shooting stop and Far Eastern affairs remain static, a greater dependence will be placed on overseas sources rather than on domestic markets.

Plan Huge Reserve — Original goal for the stockpile was $3.2 billion worth of materials over a 5-year period. Authentic figures place a $3 billion valuation on the amounts now delivered and contracted for. Long-range program now calls for a target of $8.8 billion at present-day prices.

Too Much for Military?—Charges of "unnecessary diversion" of steel supplies from civilian to military production will be aired by a Senate committee soon.

Senator Moody, D., Mich., says his new Small Business "watchdog" subcommittee is out to prevent smaller firms from being driven to the wall because of overcautious government programming.

Ask Full Information — Moody says he will not champion civilian needs ahead of any "necessary" allotment of material for military needs. He has asked NPA and the Munitions Board for full information on the whole allocation program.

In his letter to NPA, Moody declared that the impact of the steel shortage has had "such a crippling effect on so many companies that there have arisen grave doubts that the government's material allocations program is achieving desired objectives."

Don't Scrap PROFITS- from Scrap!

Today your DORMANT SCRAP* means more steel to help meet all-time high defense and domestic demands. Your country NEEDS it!

Today your DORMANT SCRAP* commands high prices.

HOW TO TURN SCRAP INTO MONEY...

with an organized dormant-scrap round-up in your plant:

1. Appoint a top executive with authority to make decisions to head the salvage drive.
2. Organize a Salvage Committee and include a member from every department.
3. Survey and resurvey your plant for untapped sources of dormant scrap. Encourage your employees to look for miscellaneous scrap and report it to the committee.
4. Sell your entire organization on the need to scrap unusable material and equipment.
5. Prepare a complete inventory of idle material and equipment. Tag everything not in use.
6. Start it back to the steel mills by selling it to your regular scrap dealer.
7. **KEEP AT IT!**

* Your DORMANT SCRAP is any obsolete, broken or wornout and irreparable machinery, tools, equipment, dies, jigs or fixtures, etc., that may encumber your premises. These, in the language of steel, are *scrap*, vital to steel production, and hence convertible into cash.

Steel is normally made from scrap and new pig iron in about a 50-50 ratio. The use of scrap means *better* steel, *faster* . . . because scrap has already undergone one refining process. Today under pressure of domestic and defense demands, the steel industry is consuming purchased scrap at the rate of 100,000 tons per day . . . an all-time high. *Your* dormant iron and steel scrap is *urgently* needed.

Round-up and sale of your dormant scrap NOW will benefit you, all steel users, and our country by:

1. Keeping the steel furnaces producing at their highest rate in history.
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3. Making *better* steel, *faster*.

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THE IRON AGE
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TECHNICAL ARTICLES

Boron Steels

a new era in alloy metallurgy

Part II

By D. I. Brown
Technical Editor

Boron carburizing grades 43B17 and 43B10 have replaced 4820, 3310 and 9310 steels in some heavy duty aircraft and truck applications. In most cases fatigue and life tests on these boron steels are better than on the former grades. Hardenability of the new boron alternates 80B00, 81B00 and 94B00 series are similar but not identical to the 8600, 4100 and 4600 series which they replace.

The use of boron steels dropped sharply after War II. However, U. S. Steel Co. continued its research and in 1947 announced three carburizing boron-treated steels known as U • S • S SuperKore grades. Mack Mfg. Co., Plainfield, N. J., and Pratt & Whitney Aircraft Div. of United Aircraft Corp., East Hartford, Conn., used these steels and built up considerable experience on their heat treatment and performance in service.

Two other peacetime applications of boron steels are noteworthy. At Caterpillar Tractor Co., Peoria, Ill., the 86B45 steels continued to be used and have been in application right up to the present. On the West Coast the Sierra Drawn Steel Co. used thousands of tons of 10B50 steels. These carbon steels boron-treated replaced the former AISI 4142 and NE 9440 grades and were found satisfactory in every respect.[6,7] (References, Part I.)

Probably the most interesting development work on boron steels right after War II concerned the carburizing grades. The U • S • S SuperKore grades resulted from an effort to find a steel comparable in hardenability to 3310 and 9310 which would not have retained austenite and undissolved carbides after carburizing and heat treatment. SuperKore A is a 4312 steel plus boron and 0.03 to 0.07 V. Fig. 4 compares the hardenability of this steel with 3310.[2] (Reference, Part I.) This boron steel alternate has 2½ pct lower total alloy content than the one it has replaced.

Part II 43B10 and 43B17 replace 3310 and 9310 . . . Boron steels better in wear and fatigue tests... Hardenability of alternates falls off faster after 8-sixteenths on the Jominy bar than with the former steels.

This boron grade plus 43B17, U·S·S Super-Kore AA, have replaced 3310 and 9310 steels in certain applications. Many tons have been used for highly critical parts with excellent results.

The experiences of Pratt & Whitney with a similar boron steel prove again that critical parts can be made just as satisfactorily from these lower alloy steels. In this case, AISI 43B10, U·S·S SuperKore A, specification AMS 6266 was used instead of AISI 9310 specification AMS 6260, a steel containing 3.00 to 3.50 Ni, and 1.00 to 1.40 Cr, plus 0.08 to 0.15 Mo. Comparison of case depth and maximum carbon contents of 43B10 and 9310 appear in Table VI.

Critical temperatures as determined by the producer for 43B10 are 1292°F and 1544°F on heating and 1050°F and 662°F on cooling. Carburizing tests were performed in production gas carburizing equipment at 1700°F, using both continuous (Westinghouse) and batch (Homocarb) furnaces. The continuous carburizing cycle consisted of 7½ hr at heat followed by a relatively fast cooling in the furnace atmosphere. The batch carburizing cycle consisted of 5½ hr at heat followed by relatively slow pit cooling.

Heat treatments for machinability during processing of 43B10 are similar to those used for 9310. The forgings are normalized and tempered to a hardness range of Bhn 229 to 269, and parts requiring machining of carburized areas prior to hardening are tempered to reduce the case hardness to not over Rc 36. For final heat treatment, 43B10 parts are austenitized at 1550° to 1600°F, quenched in oil and tempered at 300°F.

It was found that carburizing and heat treating characteristics of 43B10 steel differed only in minor degree from those of high-hardenability carburizing grades not treated with boron. Diffusion of carbon in 43B10 steel was somewhat

TABLE VI

43B10 V 9310

Case Depth at 0.25 Pct C

Steel	Type of Carburization	Carburizing Time and Temp.	Case Depth, In.	Maximum Carbon Content, Pct
43B10	Continuous	1700°F (7½ hr)	0.061	0.84 (0.003 in. beneath surface)
9310	Continuous	1700°F (7½ hr)	0.053	0.84 (0.005 in. beneath surface)
43B10	Homocarb	1700°F (5½ hr)	0.065	1.08 (0.008 in. beneath surface)
9310	Homocarb	1700°F (5½ hr)	0.058	1.25 (0.003 in. beneath surface)

TABLE VII

43B10 V 9310, PROPERTIES AFTER HEAT TREATMENT

Case and Core Hardness

Steel and Type of Carburization	As Carb, Ra	Carburizing Temp., 1200°F 2 hr, Ra	As Quenched, Ra	Direct Quench 300°F Temper, Ra	Core, Rc	As Quenched, Ra	Reheat (1600°F) and Quench 300°F Temper, Ra	Core, Rc
43B10 Continuous	78-78	69.5-70.5	83-84	82.5-83	37-38	85.3-84.5	81-83	37-39
9310 Continuous	77.5-78.5	72-73.5	82-84	80.5-81.5	37-38	80.5-82	78.5-81	37-39
43B10 Homocarb	69-72	67-69.5	77-80	79.5	34-33	82-82.5	80.5-81.5	37-38
9310* Homocarb	65.5-72	77-76	65-74.5	64-65	34.5-33	79-82.5	79	37-39

* Variable hardnesses were due to excessive amount of retained austenite. 9310 steel showed greater retention of austenite and undissolved carbides regardless of type of carburization.

Core Mechanical Properties, 9310

Pseudo Carburized	Quench Temp., °F	Quench Medium	Tempering Temp., °F	Tensile Strength, psi	Yield Strength, psi	Elong., pct	Reduction of Area, pct	Izod Impact, Ft-lb
1700°F (8 hr)	Direct Quench	Oil	350	166,250 to 169,000	116,000 to 120,000	15.0 to 16.0	54.9-58.8	49-51
1700°F (8 hr)	1575	Oil	350	179,250 to 188,000	119,000 to 125,500	14.5 to 15.5	53.8-54.9	36-38
1700°F (8 hr)	1525	Oil	350	182,750 to 184,500	123,400 to 125,500	15.0	52.5-53.8	34-36

greater than in 9310. This was reflected in lower maximum carbon content with resultant decrease in amount of retained austenite and massive carbides. Carburized 43B10 steel showed a somewhat greater tendency to decarburize in subsequent heat treatments than did carburized 9310.

Highly stressed parts such as gears, shafts and couplings have been manufactured from 43B10 forgings and bars. Machinability has been found to be similar to that of 9310 steel. Response to carburizing and heat treatment has been satisfactory, with distortion of parts very similar in amount and character to that of 9310 parts. Table VII shows the properties of case and core after heat treating the two grades.

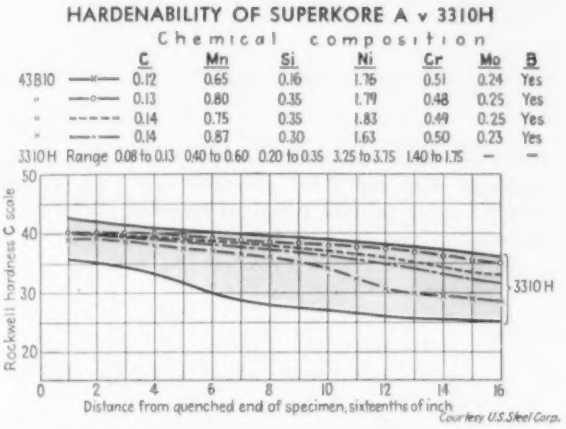

HARDENABILITY OF SUPERKORE A v 3310H
Chemical composition
C Mn Si Ni Cr Mo B
43B10 —×— 0.12 0.65 0.16 1.76 0.51 0.24 Yes
" —○— 0.13 0.80 0.35 1.79 0.48 0.25 Yes
" ----- 0.14 0.75 0.35 1.83 0.49 0.25 Yes
" —·— 0.14 0.87 0.30 1.63 0.50 0.23 Yes
3310H Range 0.08 to 0.13 0.40 to 0.60 0.20 to 0.35 3.25 to 3.75 1.40 to 1.75 — —
Rockwell hardness C scale
50
40
30
20
0 2 4 6 8 10 12 14 16
Distance from quenched end of specimen, sixteenths of inch
3310 H
Courtesy U.S. Steel Corp.

FIG. 4—The hardenability of 43B10 falls well within the standard H band for one of the former high alloy grades used.

Cold treatment of 43B10 steel parts has not been found necessary in order to meet minimum case hardness requirements; such treatment is occasionally necessary with 9310 parts. Engine service records of the 43B10 steel parts have been highly satisfactory.

Fig. 5 A and B show the direct quench microstructures of the case of 9310 after Homocarb and continuous gas carburizing. In Fig. 5 C and D micros of the hardened case of 43B10 steel treated identically are also shown.

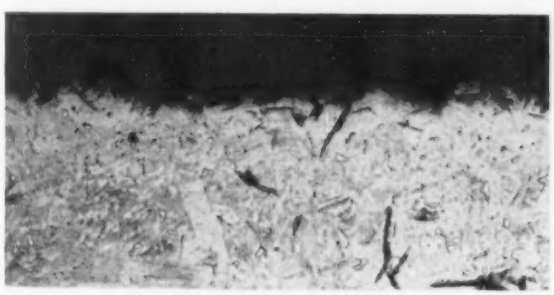
In the case of Mack Mfg. Co., the lean alloy boron-treated 43B17 has proven a better steel than the former high nickel 4820 grade. Mack Mfg. has had 50 tons of 43B17 heavy-duty countershafts in service for 5 years and no failures have occurred. During the same period two failures of the same type of shafts made from 4820 were experienced.

Boron steel has better wear life

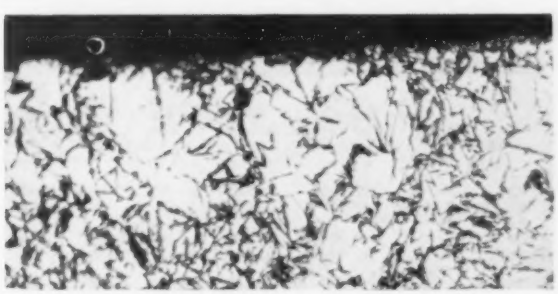
Amsler wear tests at Mack Mfg. on gears and pinions show the carburized 43B17 parts have stood up twice as long as the same parts made of 4820H. Tests on these parts were run at compressive stresses of 200,000 psi with a 30 pct slip factor. The surface carbon of carburized 43B17 parts averaged 0.70 C. The carbon content at the surface of the 4820H parts was between 0.90 to 0.95 C which is standard practice for the high nickel steel.

A standard pack carburizing practice used on 4820 does not produce good results when employed on 43B17 parts. This lesson was learned

43B10



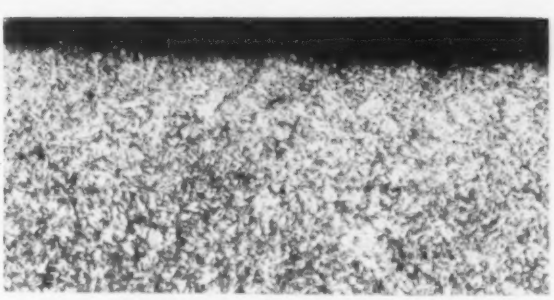
A—HOMOCARBURIZED



B—CONTINUOUS GAS CARBURIZED

9310

C—HOMOCARBURIZED



D—CONTINUOUS GAS CARBURIZED

FIG. 5—Comparison of case microstructures after two different types of carburizing. All samples direct oil-quenched and tempered at 300°F for 1 hr. 250X, etchant 2 pct nital.

very early in the program and a modified practice was perfected. The old practice when applied to the new steel often produced soft spots on the case. For this reason the carbon content at the surface has since been lowered to preclude retained austenite. Low impact values were also experienced when standard carburizing methods were used on this boron steel.

Likewise the standard carburizing compounds which work well on 4820 steels were found not to be satisfactory for the 43B17, SuperKore AA steel. At Mack Mfg. a compound containing 10 pct dolomite as an energizer is used in pack carburizing. This compound consistently produces surface carbons from 0.70 to 0.80 while the standard compounds produce surface carbons as high as 1.10 C. Usually no change in carburizing practice on 43B17 is necessary when using continuous gas carburizing furnaces.

The mechanical properties of carburized specimens of some popular gear steels both old and new types are shown in Table VIII.

The effects of surface carbon concentration on hardness and impact values for the new and old steel are shown in Fig. 6. In conventional carburizing methods 4820 shows a surface carbon of about 1.00 C while 43B17 is slightly above this value for case depths of about 0.060 in. The unnotched Charpy impacts reflected this difference in surface carbon and showed that in the standard carburizing methods 4820 is superior to 43B17. This is not surprising as the carburizing practice used was evolved through the years as the practice for the high nickel steel.

TABLE VIII

PROPERTIES OF PSEUDO-CARBURIZED SPECIMENS

Steel	Yield Strength 0.2 pct offset, psi	Tensile Strength, psi	Pct Elong. in 2 in.	Reduction of Area, pct	Tensile Hardness, Rc
43B17	157,000	198,000	15½	56.9	40
7 ton E. F. heat	154,000	198,000	15	58.2	40
43B17	144,000	187,000	12½	43.2	39
43 ton E. F. heat	147,000	193,000	13	48.2	41
43B17	146,000	192,000	15	60.1	44
100 ton O. H. heat	149,000	196,000	15	57.1	42
43B17	141,000	186,000	12½	45.2	42
100 ton O. H. heat	145,000	187,000	13½	49.3	41
46B20	145,000	193,000	14	50.8	41
SuperKore B	147,000	193,000	14	51.9	41
4820	168,800	213,500	13	45.0	43
	166,600	213,500	14	45.6	43
4820	160,000	192,750	15	53.8	46
	165,000	207,075	14	47.5	45
94B20	160,000	223,000	13.8	44.7	47
	164,000	222,000	12.5	46.9	46

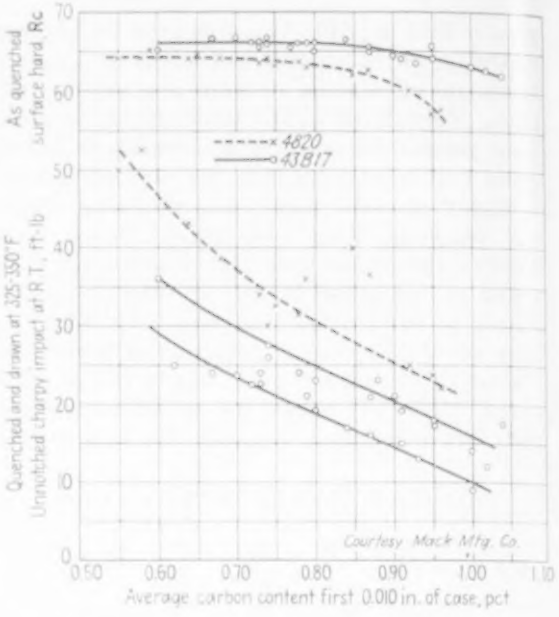

As quenched surface hard, Rc
Quenched and drawn at 325-350°F Unnotched charpy impact at R.T., ft-lb
4820
43B17
Courtesy Mack Mfg. Co.
Average carbon content first 0.010 in. of case, pct

FIG. 6—Comparison of surface carbon, hardness and impact values of 4820 and 43B17. Samples were carburized at 1700°F, cooled to 1450°F and oil-quenched. Case depth was 0.060 in., core hardness Rc 40 to 44.

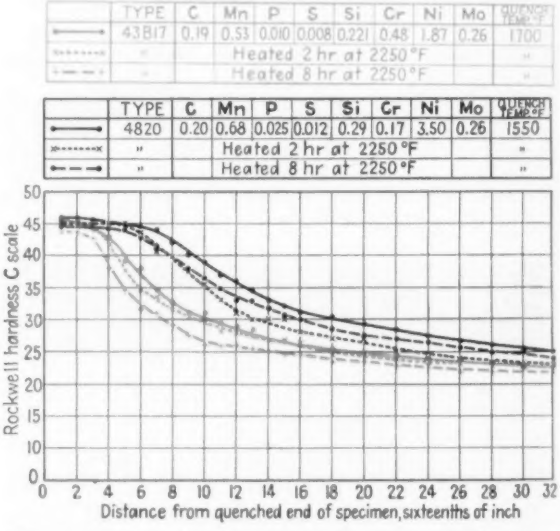

TYPE C Mn P S Si Cr Ni Mo QUENCH TEMP °F
43B17 0.19 0.53 0.010 0.008 0.221 0.48 1.87 0.26 1700
Heated 2 hr at 2250°F
Heated 8 hr at 2250°F
TYPE C Mn P S Si Cr Ni Mo QUENCH TEMP °F
4820 0.20 0.68 0.025 0.012 0.29 0.17 3.50 0.26 1550
Heated 2 hr at 2250°F
Heated 8 hr at 2250°F
Rockwell hardness C scale
Distance from quenched end of specimen, sixteenths of inch

FIG. 7—Holding at forging heat did not materially affect the subsequent hardenability of 43B10 or 4820.

the simple change in the compound used in pack carburizing is all that is necessary. In continuous gas carburizing a higher than usual dew point (30) gas is used. No propane is introduced in the last two chambers of the furnace and air is bled into the third chamber from the end. The 43B17 parts are direct quenched from 1525°F just as in the old practice.

To determine the possibilities of fading in hardenability of 43B17 when held at forging heat several end quenched bars of both steels were held at 2250°F for 2 hr. These results are plotted in Fig. 7. Again, both steels behaved similarly.

Both electric furnace and openhearth heats of 43B17 have been used on truck parts by Mack Mfg. In certain cases, 46B20, SuperKore B, is now employed instead of the higher nickel 4820. In recent months the former 43B17 on which Mack did much of the early testing and use has been modified to a 43B (i.e. 43BV14) 14. In this grade, the only difference is a lower carbon range, 0.10 to 0.16, and a specified vanadium content. The vanadium is usually secured by using the boron ferro-alloy Grainal No. 1. The analysis of the ferro-alloys were given in Part I, Table IV.

The boron steels have been engineered on an equivalent hardenability basis to former grades. Therefore, the fastest and most suitable way to choose an alternate steel is through a comparison of hardenabilities. Often this proves to be only a preliminary step as later case histories of actual applications will show. The two tables in Part I offered substitution of alternates for former grades without benefit of comparable hardenabilities. For that reason, four steel grades listed in those tables as alternates have been chosen to show how their hardenabilities compare. In Table IX the chemistry of four standard grades and their recommended alternates are shown.

Generally the 80B20 is meant to replace parts which have been made of 8620 steel. In Fig. 8, the end quench results of 80B20 experimental heats are plotted against the experience limits of 8620. These heats were purposely melted to the high and low side of the 80B20 chemistry ranges and the end quench results fall almost in the center of the 8620 H band. End quench tests from a full-sized production heat made by regular commercial boron steel practice fell within

TABLE IX

ALLOY CONSERVATION AT WORK

Steel Grade	C	Mn	Si	Ni	Cr	Mo	B
8620	0.18 / 0.23	0.70 / 0.90	0.20 / 0.35	0.40 / 0.70	0.40 / 0.60	0.15 / 0.25	....
or							
80B20	0.17 / 0.23	0.60 / 0.90	0.20 / 0.35	0.20 / 0.40	0.15 / 0.35	0.08 / 0.15	0.0005 Min
8640	0.38 / 0.43	0.75 / 1.00	0.20 / 0.35	0.40 / 0.70	0.40 / 0.60	0.15 / 0.25	....
or							
80B40	0.37 / 0.45	0.70 / 1.00	0.20 / 0.35	0.20 / 0.40	0.15 / 0.35	0.08 / 0.15	0.0005 Min
4140	0.38 / 0.43	0.75 / 1.00	0.20 / 0.35	....	0.80 / 1.10	0.15 / 0.25	....
or							
81B40	0.37 / 0.45	0.70 / 1.00	0.20 / 0.35	0.20 / 0.40	0.30 / 0.55	0.08 / 0.15	0.0005 Min
4340	0.38 / 0.43	0.60 / 0.80	0.20 / 0.35	1.65 / 2.00	0.70 / 0.90	0.20 / 0.30	....
or							
86B45	0.43 / 0.48	0.75 / 1.00	0.20 / 0.35	0.40 / 0.70	0.55 / 0.75	0.08 / 0.15	0.0005 Min

END QUENCH HARDENABILITY - 80B20 vs 8620

	Chemical composition						
	C	Mn	Si	Ni	Cr	Mo	B
8620 Range	0.18 to 0.23	0.70 to 0.90	0.20 to 0.30	0.40 to 0.70	0.40 to 0.60	0.15 to 0.25	—
80B20 Low exper. heat	0.19	0.50	0.25	0.25	0.19	0.12	0.0007
80B20 High exper. heat	0.21	0.60	0.31	0.41	0.26	0.15	0.0009
80B20 Production heat	0.19	0.65	0.31	0.33	0.23	0.14	0.0012

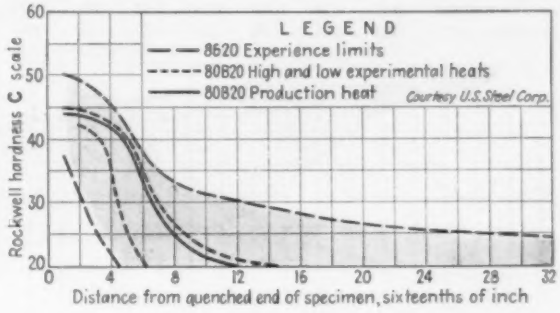

LEGEND
8620 Experience limits
80B20 High and low experimental heats
80B20 Production heat
Courtesy U.S.Steel Corp.
Rockwell hardness C scale
Distance from quenched end of specimen, sixteenths of inch

FIG. 8

END QUENCH HARDENABILITY - 80B40 vs 8640

	Chemical composition						
	C	Mn	Si	Ni	Cr	Mo	B
8640 Range	0.38 to 0.43	0.75 to 1.00	0.20 to 0.35	0.40 to 0.70	0.40 to 0.60	0.15 to 0.25	—
80B40 Low exper. heat	0.39	0.62	0.22	0.26	0.14	0.12	0.0019
80B40 High exper. heat	0.42	0.90	0.40	0.38	0.31	0.12	0.0020

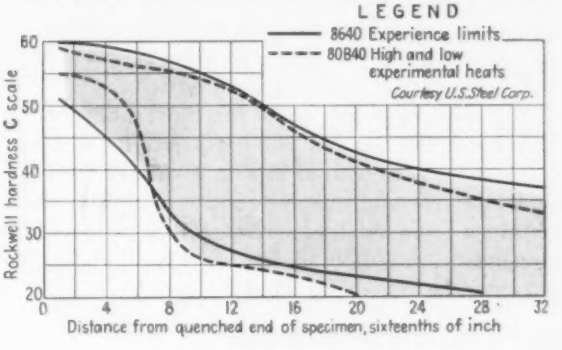

LEGEND
8640 Experience limits
80B40 High and low experimental heats
Courtesy U.S.Steel Corp.
Rockwell hardness C scale
Distance from quenched end of specimen, sixteenths of inch

FIG. 9

END QUENCH HARDENABILITY - 81B40 vs 4140

	Chemical composition						
	C	Mn	Si	Ni	Cr	Mo	B
4140 Range	0.38 to 0.43	0.75 to 1.00	0.20 to 0.35	—	0.80 to 1.10	0.15 to 0.25	—
81B40 Low exper. heat	0.38	0.77	0.28	0.21	0.33	0.09	0.0022
81B40 High exper. heat	0.43	1.12	0.43	0.39	0.53	0.16	0.0025
81B40 Production heat	0.40	0.85	0.27	0.33	0.48	0.13	0.0011

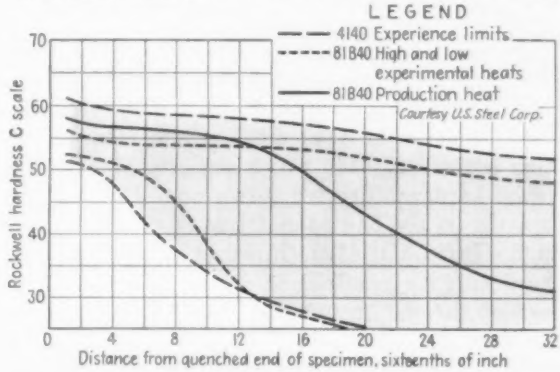

LEGEND
4140 Experience limits
81B40 High and low experimental heats
81B40 Production heat
Courtesy U.S.Steel Corp.
Rockwell hardness C scale
Distance from quenched end of specimen, sixteenths of inch

FIG. 10

END QUENCH HARDENABILITY – AVERAGE HEAT
4340 vs 86B45 vs 8645

Chemical composition

Legend	Grade	C	Mn	Si	Ni	Cr	Mo	B
×——×	4340	0.40	0.70	0.27	1.84	0.81	0.25	None
o——o	86B45	0.45	0.81	0.27	0.51	0.50	0.21	0.0012
Δ——Δ	8645	0.45	0.85	0.29	0.56	0.52	0.20	None

Courtesy U.S. Steel Corp.

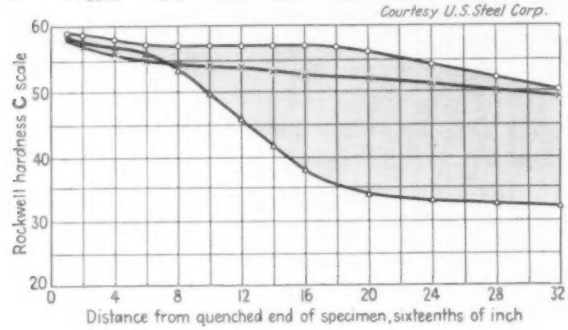


FIG. 11

the narrow band range of the small 80B20 heats.

The high and low hardenabilities of 80B20, shown in Fig. 8, should not be taken as guaranteed H band limits. Such limits will eventually be set and published H bands will be available but only after many heats of this chemistry made by many producers are tested. This applies to all the boron steel hardenability curves which will be shown in this series of articles.

The alternate for 8640 for most purposes is the new 80B40 grade. The hardenability of these two grades is compared in Fig. 9. Again the high and low side end quench results of 80B40 were obtained from small experimental heats. Production heats of 80B40 so far have reproduced the expected hardenability shown here.

Hardenability drops faster

The hardenability of the 81B40 grade compares favorably with 4140 which it will replace, as shown in Fig. 10. The production heat of the new grade is slightly higher than might be expected. Experience so far on many of the new boron steels indicates that low hardenability very seldom occurs. Usually the new grades have shown equal or slightly higher hardenability for the first 8 sixteenths than the grades they replace. Later some particular instances will be cited.

In Fig. 11, the high hardenability 4340 grade is compared to two grades, 8645 and 86B45. The boron grade has proved to be a good alternate for most regular 4340 applications. One exception is the AMS 4340 which requires higher than usual hardenability for this grade. Up to 8 sixteenths on the end quench test 8645 will usually suffice instead of 4340. However, if the minimum hardenability required on a part is beyond J 55 at 8 on the end quench test, 86B45 would have to be used.

It is evident from the four hardenability comparisons just cited that the end quench curves are similar but not identical. The boron steels show good hardenability for the first 6 to 8 sixteenths on the end quench bar and then drop more rapidly than the former grades. The suitability of the alternate steels for a particular application therefore depends more than ever on which part of the hardenability curve is really significant in a given application.

Fortunately many companies have built up considerable experience in using the H band alloys and know the critical minimum and maximum hardness needed at various distances on the end quench test to satisfactorily meet heat treated properties in any particular part. Those who have yet to develop this experience are now going to have to catch up fast.

It is evident that alloy steels have often been used wastefully in the past. Maximum alloy conservation consistent with good performance of heat treated parts can only be realized by a precise knowledge of the minimum properties actually needed to guarantee satisfactory service for each and every type of part.

For the program to be successful, it will require better control in heating, quenching and drawing operations; better equipment and better metallurgical supervision of these operations. Not in the least this program also makes mandatory much more precise engineering by those who design the gears, axles, pinions, shafts, springs and the hundreds of other heat treated parts required to keep our dual civilian and military economy rolling at high speed.

Part III to appear in next week's issue will cite heat treating, testing and applications of the 80B00, 94B00 series steels which are in heavy production.

NEW BOOKS

"Tool Engineering," by A. P. Gwiazdowski, presents a broad survey of machines and methods used in American industry today. The author has used production of a typical part to maintain logical sequence in discussing processing and machining operations. Various machining, inspection and gaging methods, heat treatment of ferrous alloys and welded assembly of jigs and fixtures are discussed at length. C. C. Nelson Publishing Co., Appleton, Wis. 306 p.

"Effects of Taxation on Executive Compensation and Retirement Plans," by C. A. Hall, Jr., studies effects of federal taxation on deferred-type compensation plans for executives. American industry has developed a professional management group which relies heavily on personal compensation rather than business ownership. Relative tax advantages of widely used compensation plans including salary, bonus, profit-sharing, stock option, stock purchase, and retirement are discussed. Harvard Business School. $4.25. 365 p.

Analyzing stabilized stainless now takes LESS TIME

by J. F. Young
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Chemical-spectrographic analysis of tantalum-columbium line intensity ratio and weight ratio is at least as accurate as any other routine method. Also, it is faster than point-to-plane technique and does not require stainless steel standards.

Due to a shortage of columbium, tantalum[1] is now being used in stainless steels as a stabilizing element to replace part of the columbium previously required. This has necessitated investigation into methods of analysis for tantalum.

Wet methods[2] of analysis suffer mainly from the great deal of time involved. There are also errors due to interfering elements[3] such as tungsten, molybdenum and titanium. Spectrographic methods are hampered by the extremely low sensitivity of the tantalum lines. A method has been used whereby the columbium is determined spectrographically and the columbium-plus-tantalum is determined by conventional wet methods. The tantalum is then determined by difference.

This method is unsatisfactory for two reasons. It has all the drawbacks previously mentioned concerning wet methods of analysis. In addition, for very small values of tantalum the error in columbium percentage will result in a much higher percent error in the tantalum value. In fact the method would not determine the presence or absence of tantalum at extremely low values.

A method has been developed in this laboratory whereby the tantalum and columbium are separated as the pentoxides, and the tantalum-to-columbium ratio is determined spectrographically. The columbium is determined concurrently with the other elements in stainless steel spectrochemically.[4] In this method, the oxides are separated only once and the silica is not volatilized. This reduced the wet chemistry to approximately one half the time ordinarily consumed in analyzing columbium-plus-tantalum.

A point-to-plane method of determining tantalum has been developed[5] which is preferred where applicable due to its speed. However, this method requires a number of standards containing known amounts of tantalum, which are not available at present. Also, very thin samples cannot be analyzed with any degree of accuracy due to the extremely hot spark.

The following method has been used not only to develop suitable standards for the point-to-plane method, but to analyze samples unsuitable for point-to-plane techniques.

How standard solution is prepared

Preparation of a standard solution for use in the analyses started with the fusing of approximately 3g of tantalum pentoxide with potassium pyrosulfate. The melt was dissolved in a hot solution of ammonium oxalate. This solution was then diluted to about 2 liters and allowed to cool.

Three 25 ml aliquots were transferred from the bottle to 400 ml beakers. To each beaker were added 10 ml nitric acid and 30 ml perchloric acid. The beakers were covered with watch glasses and heated to white fumes. The solutions were diluted to 200 ml and 50 ml of sulfurous acid were added. Filter paper was added and the solutions allowed to digest for 15 min on the hot plate. The solutions were filtered through Whatman No. 42 filter paper

and the precipitate washed with hydrochloric acid (1:49) until free of perchloric acid.

The precipitate and papers were transferred to, ignited and weighed in porcelain crucibles. The paper was charred and then ignited at about 1832°F for 15 min. The crucibles were cooled in a desiccator and weighed. This was calculated to milligrams of tantalum per milliliter of solution.

The samples in these crucibles were next used to establish the working curve accompanying this article. It shows the tantalum to columbium line intensity ratio versus the weight ratio of tantalum to columbium.

Ten 2.5 g samples of U. S. Bureau of Standards samples No. 123 were weighed into ten 400 ml beakers and dissolved in 25 ml hydrochloric acid and 5 ml nitric acid. To these solutions were added varying volumes of the standard solution previously prepared.

To these solutions, 30 ml of perchloric acid were added and they were heated to white fumes. They were then treated the same as the standard solution after fuming.

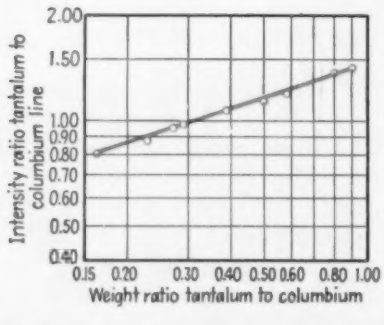
The oxides in each of the crucibles were then mixed thoroughly with 0.2 g of lithium carbonate. The resulting mixtures were then ready to be used in the spectrographic procedure.

The samples of lithium carbonate and oxides were transferred and tamped level into a center post crater type of graphite electrode. A plain graphite rod was used as a counter electrode.

The electrodes were spaced a distance of 2 mm with the sample electrode (anode) beneath. Excitation was supplied by an Applied Research Laboratories' Multisource unit with the following settings: capacitance 60 mf, inductance 400 microhenries and 20 ohms resistance set for a dc arc-type excitation.

The sample was prearced for 30 sec and the shutter opened for an additional 10 sec.

The spectrum was recorded on Eastman Spectrum Analysis #2 film and the film processed. The film was placed on the densitometer and transmissions of 3310.5 columbium lines and 3311.0 tantalum lines were determined.



WORKING CURVE for determination of tantalum-to-columbium weight ratio.

TABLE I

ANALYSES OF UNKNOWN SAMPLES

Calculated Value	Spectrochemical Value
0.16	0.17
0.23	0.23
0.27	0.29
0.39	0.39
0.40	0.40
0.58	0.57

TABLE II

ANALYSES OF TESTED SAMPLES

Wet	Spectrographic			
Cb + Ta (As Cb)	Cb	Ta/Cb	Ta	Cb + Ta (As Cb)
1.12	0.82	.37	.30	1.08
0.90	0.74	.23	.18	0.89

The procedure for determining the tantalum-columbium ratio on an unknown sample of columbium-stabilized stainless steel is the same as that used to establish the working curve, except that there is no stock solution added.

The analytical lines presented here do not follow one another exactly for all exposure levels. Therefore all spectrographic analyses should be in triplicate. The amount of sample derived from the chemical procedure detailed here is adequate for several analyses, so this will not entail a great deal of added time.

Due to the limited availability of good standard samples for the determination of tantalum in stainless steel, the accuracy of the method could not be checked in this manner. Table I, however, gives analyses of samples prepared in the same manner as the standard samples.

Two stainless steel samples were obtained which had been checked in several laboratories for columbium-plus-tantalum and could be considered reliable. The results of analyses of these samples are shown in Table II.

Experience with this combination of a wet chemical method with a spectrochemical method indicates that it is at least as accurate as any other routine method. It is faster than any except a point-to-plane method of spectrochemical analysis. This method, unlike a point-to-plane method, is independent of the geometry of the sample and does not require stainless steel standards previously analyzed for tantalum.

Acknowledgments

The author wishes to express his appreciation for the help and advice given him by D. P. Jensen and G. J. Chris, Process Engineering Dept., Douglas Aircraft Co.

References

[1] *U. S. Dept. of Commerce, N. P. A. Order M-3, Part 21.*
[2] *"The Analytical Chemistry of Tantalum and Niobium," 1937, Chapman and Hall Ltd., London.*
[3] *W. F. Hillibrand, and G. E. F. Lundell, "Applied Inorganic Analysis," John Wiley & Sons Inc., New York, 1929, p. 110, 476.*
[4] *D. P. Jensen, "Spectrographic Analysis of Stainless Steels," THE IRON AGE, July 1947, p. 47.*
[5] *M. F. Hasler, Applied Research Laboratories, June 12, 1950.*

Wire annealing furnace fits low headroom

By W. J. Krailing
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Bridgeport Brass Co.
Bridgeport, Conn.

Expansion programs sometimes entail buying already-existing plant facilities, some of which may have limited headroom. Because of such a problem, a special wire and rod annealing furnace was designed with a pan-pull transfer car loading system to eliminate overhead handling. Fork lift trucks transport the coils and load the pans.

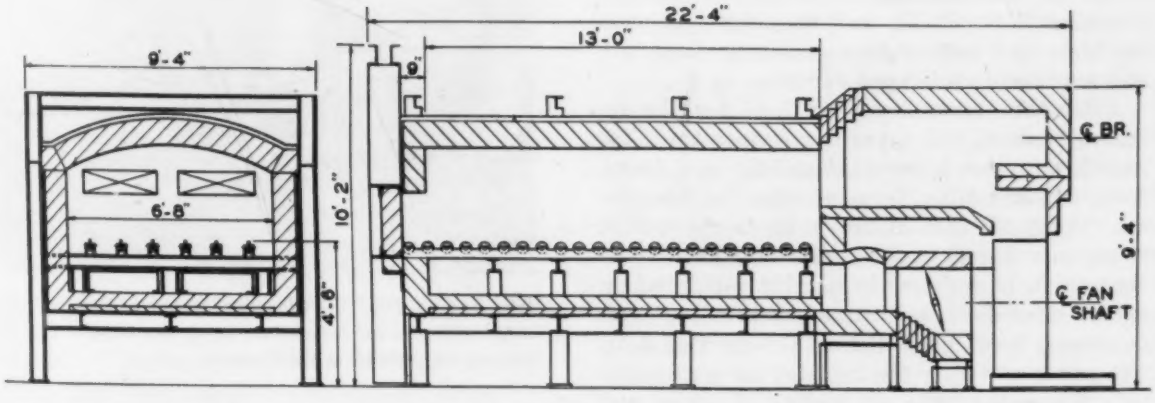


FIG. 1—Schematic drawing showing the construction of the finish annealing furnace. The furnace is essentially an oven-type unit with a gas-fired air heater.

When a brass mill has only limited room for handling materials in the vertical plane, it is confronted with a very critical operating problem. Most heavy materials handling equipment is designed for transfers, using overhead cranes and similar facilities.

In taking over the wartime Navy shell plant at Bridgeport, Conn., the Bridgeport Brass Co. found itself confronted with a fine building, but the ground floor had a working overhead space of only 12 ft. This floor was to be used for extensive nonferrous wire and rod drawing operations, embracing all types of copper base alloys in a wide range of compositions and sizes.

With the limited head room in this department, fork lift trucks instead of the usual overhead cranes are used to lift and transport loads to the various operations. As shown in Fig. 1, copper slings are utilized to lift the unit loads, and in operations such as annealing and pickling usually remain with the load being processed, thereby facilitating more efficient handling.

The same loading and handling problem was encountered in setting up heat treating equipment for the finish annealing. A rather ingenious "pan-pull" furnace, shown in Fig. 2, is employed. This furnace, designed and built by Surface Combustion Corp., permits loading and unload-

ing of pans by means of the fork lift trucks used to transport the wire coils. It also eliminates the need for overhead handling of material which was well nigh impossible under the conditions existing in the converted Navy plant.

The furnace employs a perforated chrome-iron pan about ¼ in. thick, 5½ ft wide and 12 ft long, for carrying the charge of wire to be annealed. The furnace is equipped with roller rails to facilitate moving of the pan into and out of the furnace. The perforations are about ⅜ in. diam and located on staggered 1-in. centers. The wire is loaded onto the pan as the pan rests on a loading table as shown at the right of Fig. 3. The transfer car, which moves on the rails shown is then moved up opposite the loading table.

Furnace also handles rods

The pan is drawn onto the transfer car by means of a multiple hook device mounted on a roller chain, built into the transfer car. The transfer car is then moved on its tracks for a few feet until it is opposite the annealing furnace door. This door is raised and the loaded pan of wire moved by means of a pusher head on the transfer car roller chains, as shown in Fig. 4, from the transfer car into the furnace. Loads of approximately 8000 lb of wire are processed in about 2¼ to 3 hr, depending upon the time and temperature required. Rods are also annealed in this same furnace.

After the charge has been held for the required time at the annealing temperature, the handling process is reversed and the pan drawn from the annealing furnace onto the transfer car. The car is then moved on its tracks until it is opposite the air cooling chamber. This chamber, which is designed to provide rapid cooling of the wire down to convenient handling temperatures, is equipped with an air-operated door. The pan is moved by the transfer car mechanism onto the rails of the air cooling chamber, and the fan in the roof of the cooling chamber is started.

Charge is cooled rapidly

Air is drawn from the partly opened door of the cooling chamber up through the perforated pan and through the wire—and vented through a 4-ft square hole in the roof of the cooling chamber. The heated air is carried off at this point by a duct which also serves to vent the annealing furnace. This particular air cooling chamber was developed by the Bridgeport Brass Engineering Dept. to provide for maximum speed of cooling of the wire charges.

Cooling in the chamber is further accelerated by means of water-cooled copper coils around the side walls and roof. The cooling of high zinc brasses must be carefully controlled to prevent the precipitation of the beta phase which makes the rods and wire hard and thus difficult to machine. A water spray is also available in

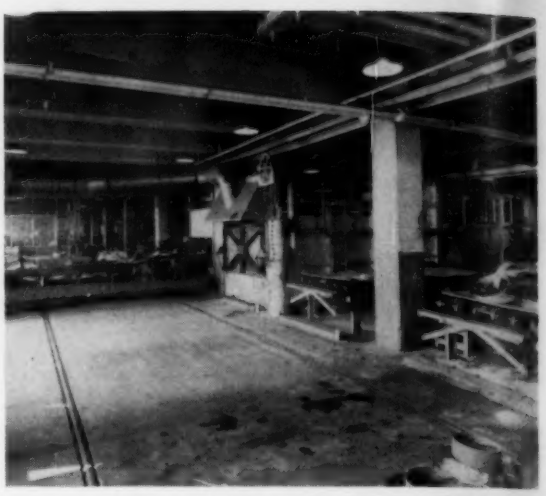


FIG. 2—Overall view of the wire finish annealing installation. Pan at extreme right is loaded with coils of wire held together by copper slings, ready for annealing. The annealing furnace is in the center and a load of wire is being transferred to the cooling chamber.

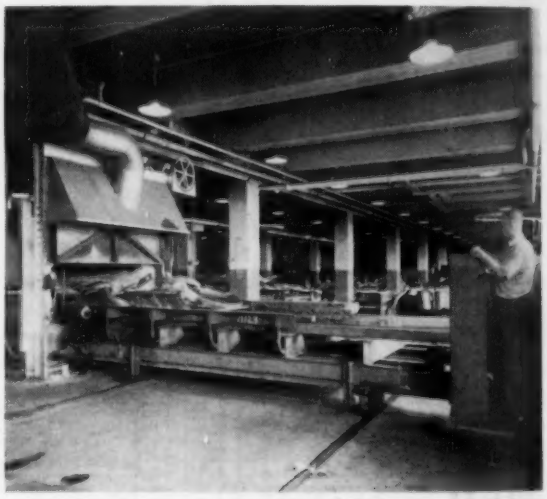


FIG. 3—Charging the annealing furnace. One operator services the entire installation, using the transfer car for loading and unloading the furnace.

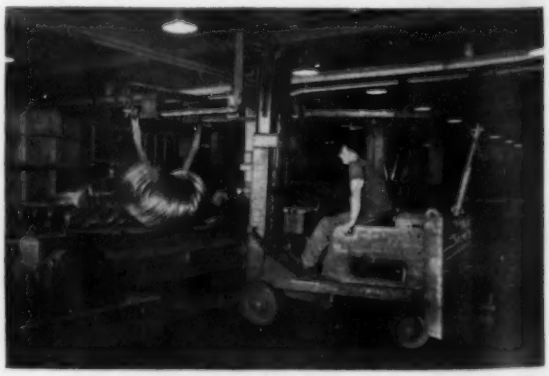


FIG. 4—Lift trucks and copper slings are used to lift and transport unit loads.

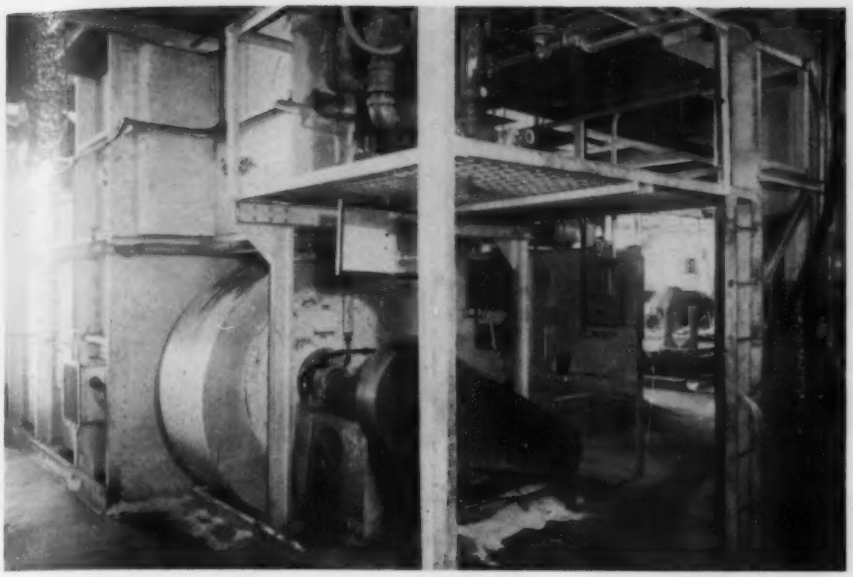


FIG. 5—A high capacity blower unit (lower center) is mounted at the rear end of the annealing furnace. The air heater unit is shown at the upper right.

the cooling chamber, but is only infrequently used, because of the pan warpage which it causes.

Most of the wire annealing work carried out in the 'Surface' pan-pull furnace is carried out at temperatures in the range of 420° to 570°C, although the furnace is used for temperatures as low as 275°C for stress relieving and up to a maximum of 675°C for annealing.

Finish annealing specifications for brass wire are based primarily on grain size, Rockwell hardness and tensile strength. This annealing furnace has provided extremely close control of the wire by all of these standards.

The uniform properties of the wire are due to the uniform temperature which is attained in the coils due to the high rate of circulation of the heated products of combustion in the convection furnace. True metal temperatures are obtainable in a convection-type furnace, and for this reason unequal size coils will respond comparably to equal crystal size specifications, provided the time cycle is sufficiently long for complete saturation of the heaviest coil. The lightest coil meanwhile will not have exceeded the desired temperature and thereby not have become softer, notwithstanding the somewhat longer time of exposure at temperature.

Obtain uniform grain size

Frequent and exact grain size measurements are made of the wire on each coil processed in the furnace and remarkably uniform grain size values are obtained. Samples are cut from each batch of wire and sections polished and examined under the microscope. The grain size is then reported as the average grain diameter in millimeters at 75X magnification.

The furnace is essentially an oven-type unit with a Surface Combustion gas-fired air heater used to provide the heat source for annealing. A maximum temperature of 675°C is available.

The air heater is a special refractory-lined unit located at the upper rear of the furnace. It is equipped with a 'Surface' low pressure automatic proportion velocity burner and constant burning pilot. The air heater burns 530 Btu carbureted water gas and has a maximum fuel consumption of approximately 3000 cu ft per hr.

Average fuel consumption for 8000-lb net charges of brass wire annealed at temperatures of approximately 500°C is about 1500 cfh. The control valves on the combustion equipment are actuated by extension handles at shoulder height from the floor. This feature has eliminated the need for frequent trips by the furnace operator to the combustion equipment control platform. Automatic temperature control equipment is used to maintain uniform temperature in the furnace.

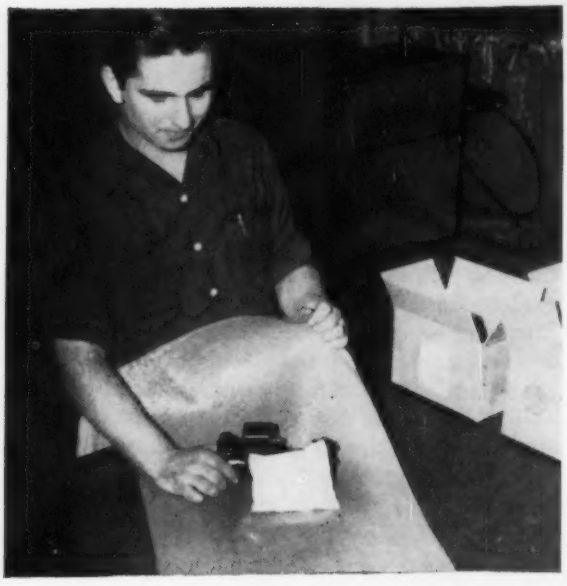
Also located at the rear of the furnace is the recirculating fan, shown in Fig. 5, which recirculates the heated gases to and from the furnace chamber. This alloy fan has a rated capacity of about 14,000 cfm of air through the work. The fan is driven by a 25 hp, 1800 rpm motor.

Height slightly over 10 ft

The furnace heating chamber has an internal width of 6 ft 8 in. and an internal length of 13 ft. The door opens to a height of 24 in. To meet the height limitations of the building, the furnace was constructed with an overall height of approximately 10 ft 6 in., the overall width being 9 ft 4 in. and overall length 22 ft 4 in. The furnace is fully insulated on the side walls with insulating firebrick and block insulation. The arch is made of insulating firebrick. The bottom is composed of insulating firebrick plus considerable thickness of block insulation.

The hearth of the furnace consists of nine roller rails located on 9-in. centers and running the full length of the furnace chamber. The rollers and rails are made of cast 35-15 chrome nickel steel.

ARMED FORCES ADOPT NEW WATERPROOF packaging



The trend toward better product protection—whether for military use or to assure safer storage on the user's shelves — is illustrated by these photos showing how a pump manufacturer wraps one of his products in a new material.

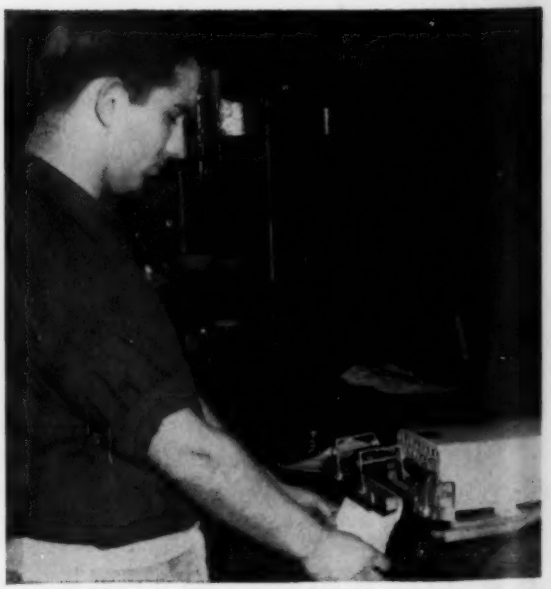
AIRCRAFT PUMPS are first wrapped in grease-proof paper, together with a dessicant enclosed in a porous cloth bag.

A new packing material has been approved by the Armed Forces under specification JAN-P-131.

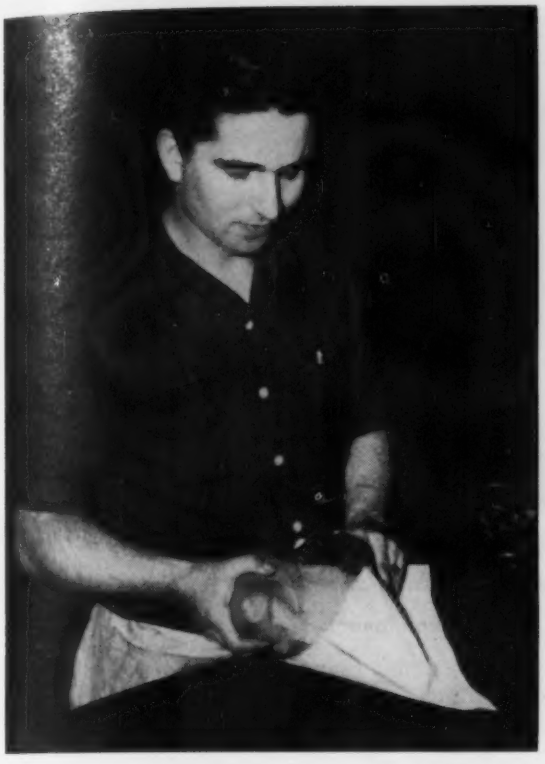
Developed by the Dobeckmun Co., Cleveland, the new wrapping is sold under the tradename "Metalam." It is composed of layers of cotton scrim, polyethelene, aluminum foil and an outer vinyl film. It is being used to protect all types of war material, from finished products to replacement parts. The time involved in putting the parts or equipment into service is cut to a minimum, because the new packaging material protects the products from any deterioration.

Grease-proof paper (by the same company), dessicant, shock absorbent packing and waterproof cartons are used in conjunction with the new Dobeckmum product. These help to prevent damage due to corrosion, rough handling, saltwater, solvents and even some acids.

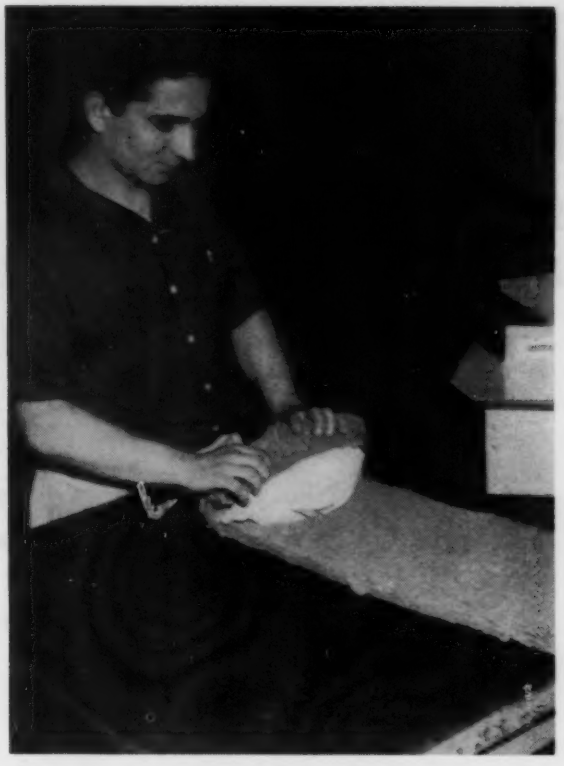
A typical operation is shown in the accompanying photographs, taken at Pesco Products Div. of Borg-Warner Corp. The packaging job done on these aircraft pumps is expected to maintain them is as-good-as-new condition for at least 5 years.



TO RETAIN the dehumidified atmosphere produced by the dessicant charge, a heat-sealed aluminum foil envelope is prepared at Pesco Product's plant in Cleveland.

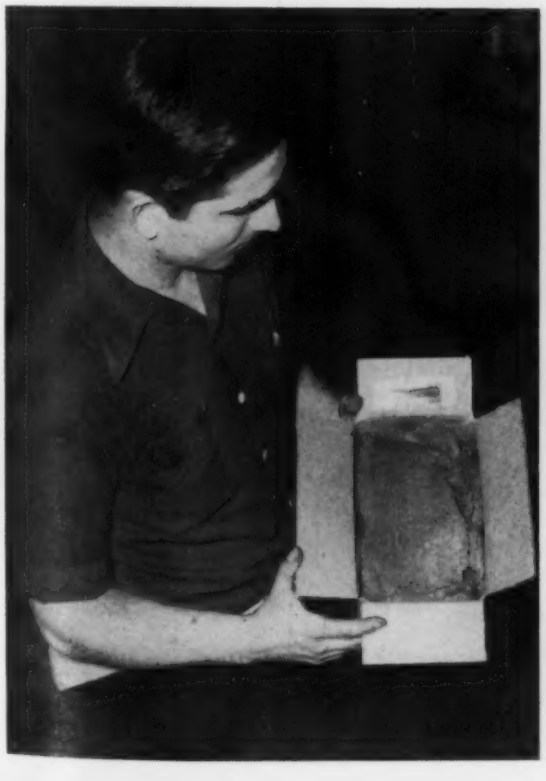


AFTER THE PUMP, wrapped in grease-proof paper, is placed in the aluminum envelope, the fourth side is sealed.

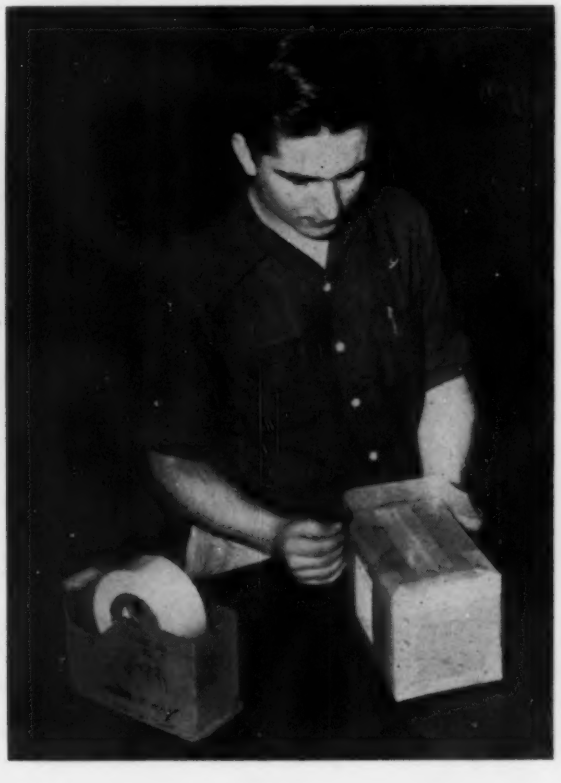


SHOCK ABSORBENT packing is applied to protect the unit against bumps in handling and travel.

MOISTURE INDICATOR is attached to the flap of the water-proof carton in which the wrapped package is enclosed.



SEALING of the carton is accomplished with an adhesive tape. The package should protect the pump until 1956.



by W. G. Patton
Detroit Editor

How good a HOUSEKEEPER are you?

When a plant has over 650 cu yd of refuse a day, housekeeping becomes a vital question. At Dow's Midland plant, things are kept shipshape and product quality protected by a combination of materials handling, salvage, paint identification, air conditioning and special maintenance setups.

Every working day Dow Chemical Co. at Midland, Mich., picks up more than 650 cu yd of plant refuse, paper, litter and sweepings. Portable self-dumping boxes are strategically located at each building. These boxes are easily picked up by specially designed trucks, becoming truck bodies with a capacity of 2½ to 6 tons—roughly equivalent to a dump truck.

As further encouragement for supervisors and employees to be good housekeepers, a large outside storage area adjacent to the salvage department is maintained. Here pipe fittings, large castings and other equipment are stored until it is decided whether they should be reworked or scrapped. Management regularly circulates a list of this equipment.

Still another good housekeeping habit becomes apparent when a visitor at the sprawling Dow plant parks his car. He observes that guard rails in the parking lot are all painted the same color. As the visitor approaches the chemical plant he sees that construction steel is painted bright red. Pipe lines are also painted in bright colors. Fire plugs are painted red at the base and have white caps so they can be easily distinguished in the dusk or at night. Most disposal cans are painted white with black identifying letters. Switch boxes are conspicuously identi-

SELF-DUMPING BOXES, capacity 2½ to 6 tons, are spotted throughout the plant grounds, providing an easier means for collection and pickup of plant litter and refuse.

AT WASTE DISPOSAL area, portable dump boxes are emptied. Incinerators take care of burnable rubbish and salvageable material is separated from scrap.

fied. Electric motors are painted to distinguish open-type, explosion-proof type and silicone-wound motors.

Powerhouse No. 5 is the latest example of the methods in use at Midland. All structural steel and piping in the plant are painted in bright colors recommended by the paint committee. Pipe lines that might drip with moisture are coated with a mastic preparation and painted. In handling coal, measures have been taken to see that the plant does not get dirty during actual handling. Dust collectors of ample capacity are provided. A system of scheduled house cleaning has been set up. There is an iron-clad rule that all coal spilled must be cleaned up immediately.

Stiffer precautions for plastics

Even more rigid precautions are taken in the new plastics building where contamination is always a threat to high quality production. Production areas are painted regularly, not so much to protect the surface as for the psychological effect of shiny new paint. Walls are painted green from the floor up to window sill level. The upper part of the walls is painted gleaming white. The company furnishes its workers fresh white coveralls and laboratory coats each morning. When the color of the manufactured product is changed, employees are given freshly laundered clothes. This is done to avoid possible contamination of the porduct.

Glazed tile is used in newer production buildings because it can be wiped clean quickly and easily. Floors are swept scrupulously. Material in warehouses is palletized and neatly stacked. All air in the plastics buildings is washed and in some sections it is kept at a constant temperature.

Good housekeeping habits are also promoted by a continuous educational campaign. Convenient spots for refuse are provided. Facilities are available to make it easy to separate burnable from non-burnable trash. Signs made in the company's own shop are placed at convenient locations. Finally, there is a specific delegation of responsibility for housekeeping in certain areas.

The importance of providing sound training of supervisors in a good housekeeping program is recognized. The plan now in effect was developed over the past four years. A big factor in the successful working of the plan is the careful attention given to organization.

The general plant superintendent is charged with the broad responsibility for housekeeping. The general shop superintendent is immediately responsible for all maintenance shops.

The service station is assigned housekeeping duties for the general plant area. These include hauling and disposal, cleanliness of plant grounds, maintenance of plant roads, materials handling and other such activities.

In addition to the responsibility for office maintenance, stockrooms, garage with its body repair shop, railroad and coal docks, the general plant superintendent has twenty different maintenance shops under his jurisdiction. Among these shops are the pipe shop, machine shop, boiler shop, paint shop, valve repair, lead shop.

Sectional maintenance crews set up

To expedite the large amount of maintenance work required, the company has set up maintenance headquarters in areas requiring a large volume of such work. A foreman, working under the direction of the general shop superintendent, has complete jurisdiction over all the routine maintenance in a given area. To promote good service and eliminate unnecessary walking and bookkeeping, crews of from eight to twenty men are taken from the central shops and temporarily assigned to a work area. Bench or office space is provided in the immediate working area. The

area foreman determines when work is to be sent to the central shop rather than make the necessary repairs on the spot.

Meanwhile, the central shop continues to perform most of the maintenance jobs. The central shop is also responsible for the quality of the work of employees assigned to the work areas.

Dow's paint committee is probably unique in industry. The committee is made up of laboratory chemists, two members of the production division, a representative from the paint shop and engineering.

The first duty of the committee is to determine the best types and quality of paint required for a specific application. The quality is determined on the basis of broad plant experience plus the technical advice of the committee members. In addition to determining suitability of paint for a specific application, the paint committee may recommend the method of applying the paint.

The production departments are not required to follow the specific recommendations of the committee. However, they do have the benefit of this group's experience in selecting paint for a particular job.

In a chemical plant, paint is only one of many factors that must be kept constantly in mind. Production involves materials and chemical processes which raise special maintenance and service problems. If greases or oils are used in the wrong places or if the right oils or greases are not used, the chemical product or the unit may be spoiled.

Nearly every pump requires a certain type of packing or gasket material. Certain chemicals require the use of certain cements. Cast iron may be used in some applications in the chemical industry where brass or steel would normally be employed. These facts must be kept constantly before the workers.

Surprisingly enough, however, general orders are issued sparingly. The small handbook furnished to all supervisors in the shops and serices division makes one exception:

"It will be considered the duty of all service and construction crews to clean up after completing their work, removing all litter and scrap to the place provided for the same and turn the equipment back in a workmanlike manner."

Communications with employees has not been neglected, but the amount of written material is undoubtedly less than in other industrial organizations. The company relies heavily on roundtable discussions between workers and supervisors and between supervisors and top management. Meetings are held regularly and discussion is free and open.

Shops and service department heads meet once each week to review all plans and discuss current maintenance and operating problems. Decisions made at these meetings are relayed to supervisors who in turn make the information available to the employees in the division. In carrying out its program of communications, special attention is given to human relations problems. The company operates a training program for supervisors.

All skilled workers are trained by the company itself. This includes pipe fitters, welders, machinists, electricians and other such specialists.

VACUUM CLEANING, fresh paint, clean clothes and air conditioning all help to keep plastics production area shipshape and free of dust and other foreign particles.

Two sizes of gear blanks machined *SIMULTANEOUSLY*

By George Elwers
Machinery Editor

A unique single point turning machine handles two sizes of work gear blanks simultaneously. Each of its five stations can be loaded with one size or the other at any time. Production is up, space is saved, and former grinding operations eliminated by this machine.

An interesting automatic machine increases production while decreasing equipment required to machine hourglass worm blanks at General Motors' Saginaw Steering Gear Division. Among its features is the ability to machine simultaneously either of two different size blanks.

The 5-station, merry-go-round type, single point turning machine is illustrated in Fig. 1. Each of its five stations has two spindles and one compound tool slide. Two sets of tools are mounted on each tool slide, one set for each spindle. The upper portion of the machine, including the spindles and tool slides, revolves continuously during operation. A set of V-belts drives all the spindles. This is arranged by wrapping the belts around the outside of the spindle sheaves. As a spindle moves into the loading position, the belts are pulled away from the sheave by an idler pulley and the spindle stopped with an automatic brake.

One model of an hourglass worm blank is shown in Fig. 2. A single tool turns the 60° chamfer, turns the 12°42′ taper, faces the shoulder, and turns the 0.010 in. radius. A second tool cuts the recess at the end of the tapered cone. All tools are solid carbide and are mounted in cartridges which can be quickly removed or inserted. The tool is preset in the cartridge at the time it is sharpened. When a tool becomes dull, the cartridge containing the dull tool is removed and a cartridge containing a sharp tool

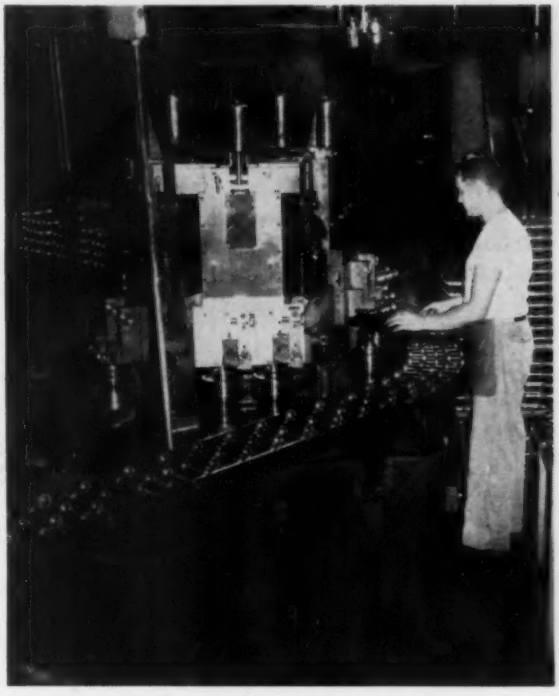


FIG. 1—The 5-station, single point turning machine.

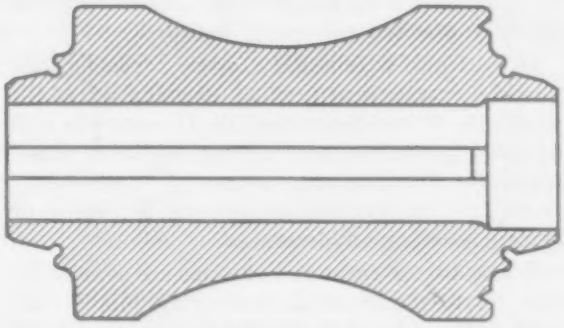


FIG. 2—Cross-section of one of the worm gear blanks. The other is similar in shape, but differs in size.

inserted. Since all tools are preset to the same dimension, no or very little adjustment is required to obtain size when tools are changed. The tool setup is shown in Fig. 3

The two models of hourglass worm blanks have different shape cones. This difference lies principally in the taper angle and diameter. The motion of the tool slides, which produces these shapes, is controlled by cams. There are two sets of cams, one for each shape. The motion of the tool slide can be changed from one shape to the other by moving the cam follower from one set of cams to the other. This can be done easily and quickly by turning a hand wheel 180°. Since the tool slides are independent of each other, one station can be set up to produce one shape cone and another station setup to produce the other shape cone. This feature permits the flow of the different models of hourglass worms to be varied with ease to meet the requirements of production.

The hourglass worm blank is loaded vertically in a double diaphragm chuck and one end machined during the first cycle. When it returns to the loading station it is upended, rechucked, and machined on the other end. The blanks are made from S.A.E. 5120.

Spindle speed is 3000 rpm which gives a surface speed of 995 sfpm. on the smaller blank and 1150 sfpm. on the larger blank. The feed is 0.0012 in. per revolution for the turning tool and 0.0004 in. per revolution for the recessing tool. Production is 500 completed pieces per hour, net.

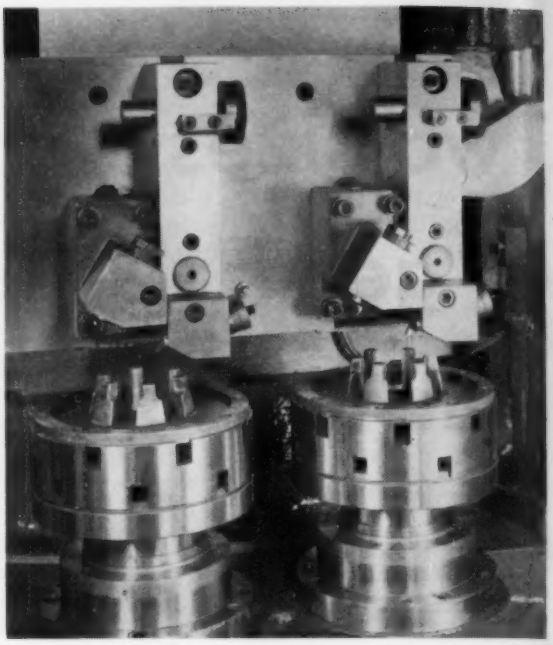


FIG. 3—Closeup of the tooling at one of the 2-spindle stations. One tool at each station cuts groove, the other turns balance of the hourglass profile.

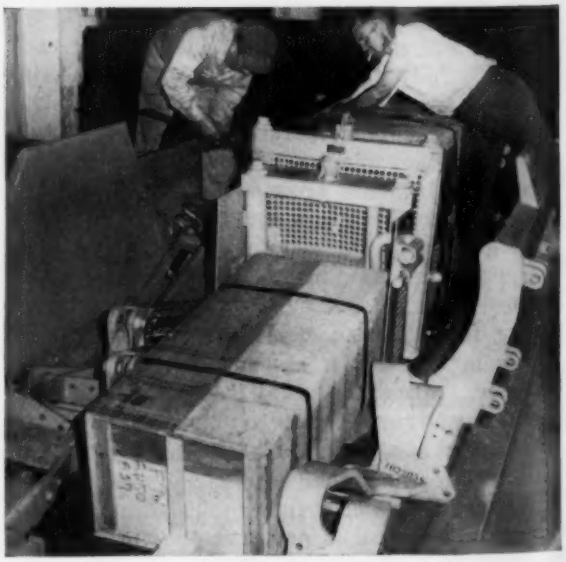
Before the installation of this machine, the tapered cones were ground after hardening. As a result of the new operation, nine grinders have been eliminated and floor space requirements reduced. In addition a superior tapered cone bearing surface is obtained.

Cheaper parts packaging eliminates "borrowing", damage

Damage, loss and pilferage, both honest and otherwise, has been largely eliminated by the packaging adopted by International Harvester Co. for bulldozer attachments. While the big pusher blades, forged fittings and other equipment occupy an entire railroad flat car, valuable hydraulic hoist cylinders, brackets, flexible connecting hoses and other smaller parts must be protected from the weather and be capable of being stacked and easily handled.

By using wirebound boxes, cross-braced where necessary to prevent shifting of heavy contents, it has been possible to securely and completely enclose parts. This has also eliminated the troublesome custom of "borrowing" from new, still-crated equipment to repair or replace existing bulldozers.

While tare weight is not a major consideration on this particular packaging job, it has been reduced to 41 lb for 750 to 950 lb of parts and fittings. It is estimated that packaging costs were cut about 50 pct.



SMALLER PARTS and assemblies for bulldozers are protected against damage, pilfering, loss and the weather by enclosing them in wirebound, steel-strapped boxes.

news of industry

INDUSTRIAL FUEL—Winter Supplies Will Be Scarce

Problem of supply will be tougher this winter . . . Industry urged to use more coal . . . Firm's supply can be halted on short notice . . . Use more byproduct gas—*By Gene Beaudet.*

The seasonal problem of keeping the nation's steel mills and industrial plants adequately supplied with fuel during the winter months will be an even harder one to solve this year. Quantities of natural gas and low sulfur residual oils are going to be scarcer. This threat to production has caused some government agencies to urge industry to make greater use of coal wherever possible.

Of the three primary fuels, natural gas is the most desirable because of its low cost, cleanliness and ease of handling. However, its availability is secondary to the demands of domestic space heating. Since it is sold mostly on an interruptible basis, a firm's supply can be shut off on a few hours' notice if domestic requirements increase.

Small Part of Needs—Some steel companies in the Chicago area have firm contracts for a small part of their requirements but such arrangements are in the minority and account for around 10 pct of their needs. Last year these mills were able to obtain between 70 and 80 pct of the amounts asked for.

Natural gas in the openhearth, whether alone or in combination with oil, depending on the furnace construction, is preferred by steelmakers since it enables them to get better production, maintain higher quality and has sulfur-free characteristics.

Aside from any unpredictable weather factors, the supply of natural gas is expected to be spread more thinly over a wider area this winter. New defense plants have sprung up since the Korean War. Reactivation of idle defense plants has forced gas companies to take on firm customers they haven't served for at least the last 4 or 5 years.

Bigger Work Load—Also, there will be an increase in the normal load from existing companies now swinging heavily into defense work. This increased load is estimated at around 20 million cu ft per day in Chicago.

Combination of these factors together with a severe winter can lower the availability of natural gas to 50 pct of the demand on a yearly basis, according to some gas company officials. As a result, steel mills plan to make greater use of by-product gases. Some are considering desulfurizing coke oven gas and using it under greater pressure in the openhearths.

When plants cannot get enough natural gas they increase their use of low sulfur residual oils proportionately. If the natural gas picture looks bad, the residual one is even more threatening.

Of particular concern is the nationalization of the Iranian oil fields. If this source is cut off, the United States would have to supply most of Western Europe. Reliable sources estimate this would mean a reduction of 25 pct in the amount of all petroleum

Turn Page

May Curb Gas Use

Though no definite order has been issued, restrictions on use of natural gas may be in the cards for next winter or sooner.

Tentative orders which would prevent supplies of natural gas from reaching new users are now being drawn up by the Petroleum Administration. Results of a conference held by members of the gas industry which met in Washington this week will be turned over to the Gas Industry Advisory Council when it meets later this month to consider the order.

It has been estimated that NPA allotted only 59 pct of minimum steel needs of the natural gas industry and the resulting lack of steel pipe has prevented completion of new transmission lines.

WSB Approval of Westinghouse Raise Knocks Hole in Wage Formula

In approving the 9¢-an-hour wage increase for Westinghouse Electric Corp. employees, the Wage Stabilization Board poked another hole in its wage formula. The increase raises the pay of Westinghouse employees to approximately 4¢ per hour above the ceiling, which is 10 pct above levels at Jan. 1, 1950.

The increase will cover approximately 100,000 Westinghouse workers eventually. It is retroactive to Apr. 16. It will add appproximately $20 million per year to Westinghouse payrolls, but the company is not contemplating price increases because Congress shut the door on price rollbacks which would have cost the company another $16 million.

INDUSTRIAL SHORTS

Electronic Tube Plant—A $6 million electronic tube manufacturing plant will be built by General Electric on a site 1½ miles south of Anniston, Ala. The plant, when completed early in 1952, will employ 2000.

From Messenger Boy—Harry L. Erlicher has retired from General Electric, where he rose from messenger boy to vice-president, to accept his new responsibilities as special assistant to UNDER SECRETARY OF THE ARMY Archibald S. Alexander.

To Build Blast Furnace—THE KOPPERS CO., Pittsburgh, will build a new blast furnace on Neville Island for Pittsburgh Coke and Chemical Co. As announced earlier, the new furnace will have a daily capacity of 850 tons of pig iron, doubling the capacity at Neville Island.

New NIAA President—John F. Apsey, Jr., Advertising Manager of THE BLACK & DECKER MFG. CO., Towson, Md., was elected president of the National Industrial Advertisers Assoc. at the annual conference held in New York.

Modern Pickling Plant — A modern job steel pickling plant has recently been completed on the West Coast and is now in operation, according to Mr. Sigmund T. Rich, president of RICH STEEL PICKLING CO. The new plant is capable of handling sheets up to 30 ft long and 6 ft wide.

First Aid Contest—A national first aid and mine rescue contest, sponsored by the Dept. of the Interior's BUREAU OF MINES, will be held at the Columbus Fairgrounds' Coliseum in Columbus, Ohio. The mine rescue contest will be on Oct. 2 and the first aid contest on Oct. 3 and 4. New rules and entry blanks may be had from John A. Johnson, 18 Federal Bldg., Duluth, Minn.

Jobber Outlets — TINNERMAN PRODUCTS, INC., of Cleveland, has announced the organization of jobber outlets to make its replacement kits more readily available. A special sales program is also planned.

New Offices and Plant—Construction of new general offices and plant facilities of the CRANE PACKING CO., of Chicago is now underway. The new plant, in Morton Grove, Ill., will enable the firm to increase production of their packings and seals.

Scrap Yard — Mike N. Hoke, Jr., of the Birmingham office of LURIA BROTHERS CO., INC., has purchased the scrap material yard of the Anniston Scrap Material Co. at Selma, Ala., from A. A. Buckner.

Present Award—The 1951 McCrea Medal, awarded annually for outstanding service to the malleable castings industry, was presented to Harry A. Schwartz, manager of research of NATIONAL MALLEABLE & STEEL CASTINGS CO.

More Oxygen—Air Products, Inc., Emmaus, Pa., has recently installed an additional generator in the plant of GRANITE CITY STEEL CO., Illinois, increasing their oxygen producing capacity by 60 pct.

New Tool Shop—A new 30,000 sq ft plant was opened by DIECRAFT in Baltimore. Harry A. Dundore, the company's owner and co-founder, stated that this is the third time the firm has moved to larger quarters since its founding in 1932.

Acquires Company — Apollo Metal Works, Chicago, has acquired the PEERLESS POLISHING CO., same city. Peerless specializes in grinding and polishing metal sheets and plates. It will be run under the Apollo name.

products available to users. Low sulfur fuel would take its toll in this percentage.

Residual Yield Falls—Even if the Iranian question is settled there is little hope of improving the supply. The increase in Midwest catalytic cracking units during the past 5 years has greatly decreased the percentage of residual yield from crude oil.

In 1945 the amount of residual obtained from crude averaged 35 to 40 pct in the Illinois, Indiana and Kentucky areas. By 1947 this had fallen to 19 pct and for the first 6 months of this year came to 15 pct. As a result, the Midwest is becoming more and more dependent on Gulf and East Coast sources for residual fuel oils.

To alleviate the overall shortage the Petroleum Administration for Defense is urging East Coast industries to convert to coal wherever possible.

Stockpile Request — They are also being asked to stockpile residual to the extent of 28 million barrels before the heating season sets in. East Coast utilities have been requested to stockpile coal equivalent to the amount of fuel oil needed during the heating season.

The OPS pricing schedules are presently working against a more equitable distribution of liquid fuels. In past years when the residual market would become tight, jobbers and refiners selling in the area would reach into the Southwest to buy fuel oil for their customers at a higher price. Now the price ceilings no longer permit them to do this and sell at a profit. It is expected that price adjustments will be made to permit a steadier flow of residual fuel oils into industrial plants.

Union Reports on Retirements

A survey by the United Steelworkers (CIO) shows that about 8500 workers are now retired under provisions of the retirement program agreed to by the basic steel industry following the strike of 1949. No figures were available

for the fabricating and processing industries.

Steel Labor, official publication of the union, asserts also that another 6000 persons not members of the union or ineligible for membership have benefited by the retirement program.

Several thousand workers beyond the retirement age of 65 have chosen to continue to work as they can under the pension agreement.

FTC Amends Rules to Permit Speedier Settlement of Cases

Beginning next month, respondents cited in Federal Trade Commission complaints will be permitted to consent to entry of an order to cease and desist without admitting participation in unlawful practice. They need only admit existence of jurisdictional facts.

This implementing amendment is expected to speed settlement of cases under Rule V of FTC rules.

Consent settlement on this basis may take place "at any time after issuance of complaint and prior to commencement of taking of evidence." On cases now pending, the same course can be followed if taking of evidence is now incomplete, and considerable time and expense may be saved.

A proposal to use the altered settlement procedure may be submitted to FTC through trial examiners. Decision as to acceptance or rejection of the proposal will be performed by the commission.

Boosts Refractories Production

An expansion program designed to increase production of refractories and other clay products has been launched by The Robinson Clay Products Co. of Akron.

Major improvements included in the program are a new tunnel kiln at Parral, Ohio; a new 36-ft periodic kiln, recently completed, also at Parral; and a new 40-ft periodic kiln, now under construction, at the company's plant in Midvale, Ohio.

TUNGSTEN—Shortage Threatens Our Defense

Senate committee blames Army and Munitions Board . . . Reveals stockpile is "pathetically" small . . . Formerly easy supply becomes critical as sources disappear—*By Ray Stroupe.*

Manufacture of armor-piercing shells for use by ground combat forces is being imperiled, a Sen Preparedness Sub-committee report maintains, by a failure of 2 national security agencies to coordinate procurement and utilization of tungsten.

Equally responsible for the nation's "little short of desperate" position as regards stocks of the metal-hardening ore, committee members charge, are the Army and the Munitions Board. The former has the job of developing high-velocity armor-piercing artillery ammunition, with cores of tungsten, while the latter agency sets the policy for procurement of critical and strategic materials, including tungsten.

Stockpile Small—Although the shell-core program requires vast quantities of tungsten, U. S. stockpiles of this vital material are "pathetically small." Just how small is not stated, as figures on stockpile totals are being kept under wraps because of security implications involved.

During World War II, the government's program for procurement of tungsten was "successful but costly," the report states. "While sufficient supplies were obtained, the United States had to pay dearly for them in the form of lost plant investments, high prices, diverted manpower, and manifold governmental regulations," it adds.

Lost Sources—Last year THE IRON AGE warned that Red China's clampdown on tungsten shipments to the U. S. "threatens our defense effort" (Nov. 30, p. 85). In 1948 more than 67 pct of our tungsten imports came from China and Korea—sources now denied us.

In 3 years during the war period the Salt Lake City chemical plant processed more than 5 million lb of tungsten. About 13 million lb came from the Yellow Pine mine in Idaho, an "accidental" source discovered by government engineers.

None of these sources can be depended upon for tungsten. The plant in Salt Lake City was sold as surplus in 1947, and stocks of ore in the Yellow Pine mine are said to be "virtually exhausted."

Needs Multiply — Meanwhile, Army Ordnance need for tungsten in its armor-piercing shells is continuing. It is implied in the report that the need could have been met with ease in the immediate postwar years when "supplies of tungsten were available almost for the asking." Yet, it is stated, "the Army neglected to tell the Munitions Board about its core requirements and the Board neglected to take any step to find out about it."

As has been pointed out, there must now be considerable reliance on production from domestic reserves and development of new

More New Boron Steels

Due to tightening of the alloy steel shortage American Iron & Steel Institute will shortly announce 14 new boron steels.

Three will be carbon-boron grades 14B35, 14B50 and 14B52. The remaining 11 grades will be the 50Bxx series, containing from one-fourth to one-half pct chromium. Carbon content in this series will run from 0.12 to 0.18 pct for 50B15 steel; for 50B60 carbon will be 0.47 to 0.55 pct.

Part II of "Boron Steels—A new era in Alloy Metallurgy" appears on page 85 of this issue.

reserves in friendly countries. This is particularly important in view of figures in the committee report, confirmed unofficially by Bureau of Mines, that indicate a possible deficit of 1,550,000 to 2,550,000 lb of tungsten this year, based on estimates which do not include uses for ammunition cores, jet engines, or atomic energy.

Recommendations—In order that the situation described might be rectified, the report recommends that:

(1) Cognizant defense agencies reach a decision on the feasibility of the "Li process"—a method of producing tungsten carbide.

(2) The Munitions Board immediately authorize stockpiling of tungsten metal powder and tungsten carbide in quantity.

(3) The Defense Department study methods for developing AP shells which would require less tungsten than present hard-core projectiles.

(4) Defense Minerals Administration ascertain whether construction of custom mills and a chemical retreatment plant will be needed for maximum domestic tungsten output.

(5) The U. S. Government be made the sole importer and reseller of foreign tungsten, utilizing private persons and firms to the fullest extent.

(6) A single federal agency, possibly the RFC, be given responsibility for all government activities in development and procurement of foreign raw materials.

(7) Office of Defense Mobilization formulate a comprehensive program for stimulation of friendly foreign tungsten production.

Conservation of Cobalt

The porcelain enamel industry is doing its bit to conserve cobalt. Porcelain Enamel Institute, Washington, reports the industry has reduced the amount of cobalt required for enameling operations from 2.2 lb per ton of steel to 1.3 lb per ton. Cobalt serves as a metal-adhering agent in the porcelain enamel ground coat.

DEFENSE—Boom Rate of Output Must Continue

Mobilizer Wilson reports good industrial progress . . . Steel expansion outpaces overall industry . . . Double aluminum capacity . . . Bulk of tooling for machine tools, capital goods.

Current boom rates of production must be continued for another 2 years if the nation is to reach safe "goals of military strength and power" necessary for national defense. This is the essence of DPA's report for second quarter 1951.

Using the report as a prod, President Truman last week renewed demands that Congress enact a new production act providing "strong production, price and wage, credit, and rent controls."

Mobilization Chief Charles E. Wilson reported good progress. Industrial production is up 12 pct from a year ago, and another 12 to 15 pct is expected within another 2 years. Military and defense orders are being placed at a billion-a-week rate.

Ahead of the Rest—Steel expansion generally has outdistanced over-all industrial production, Wilson indicates. Ingot production is at the rate of 108 million tons, he said. Wilson anticipates no serious ore troubles but is worried over the scrap picture.

WAR HEAD: Concentricity of head metal parts assembly for 3.5-in. rocket is checked on a runout gage in Oldsmobile rocket plant at Lansing, Mich.

Aluminum production capacity is being doubled over the predefense period. Here the stumbling block may prove to be lack of power.

A $10 billion bundle of orders placed during the second quarter brought the cumulative total to $42 billion since the Korean outbreak. If granted, the White House request for $49 billion will bring total defense money available through next June to $95 billion.

This would permit military and defense spending to continue at the present weekly rate of $1 billion.

Although military-defense type of production still is substantially in the tooling-up stage, DPA says, about 25 pct ($10 billion worth) of the orders have been delivered. A 100 pct delivery rate ($1 billion weekly) is seen as possible by next year.

The Defense Dept. has programmed $6 billion for plant expansion and retooling—of which 50 pct would be directed toward aircraft production and about 20 pct for tank-automotive production. Bulk of this money would go for machine tools and capital equipment.

Already 278 standby and reserve plants have gone back into defense production, and 66 more are being readied for similar use. Some 35,000 reserve and standby machine tools are back in use, and a revolving fund of $100 million has been set up to help spur machine tool production for the government.

The mobilization chief expresses

concern at growing apathy toward controls. He says there is serious doubt of reaching the 3-year defense goal if Congress maintains its current stand against further price rollbacks and a less stringent control and production act.

What will happen in the industrial fields when the shooting ceases? Will the defense program stop? This is mobilizer Wilson's answer:

"The defense mobilization program must continue whether or not fighting stops in Korea. It is the only course that can end tension and constant danger. At least 2 years of intensive labor are ahead of us before we reach our goals of strength and productive power."

New England Council Urges Modernized Industrial Methods

A list of recommendations to help improve the industrial and economic life of the New England States has been submitted to President Truman's Council of Economic Advisers by the New England Council. Acknowledging a condition of declining industrial progress, members of the New England Council stated in their report "that some firms, especially in the older, declining industries, have often missed the opportunity to extend or even maintain market positions because of a failure to follow realistic policies in the scrapping and replacing of their obsolete plant and equipment."

In one part of their report the economists from New England argued that many firms were keeping abreast of technical developments but they still lacked enterprising management. "Management responsibility in the hands of third and fourth generations, who often do not show the ability of the original owners, partially explains management deficiencies."

Recommended in the report to the president was the need for a steel mill, additional power plants, and modern industrial buildings and practices.

NPA COMPLIANCE—Industry Falls Into Line

On the average American industry is cooperating . . . NPA audit of industry begun . . . Hope of the smaller manufacturers held to be in Class B program.

As a result of some 2000 investigations made in manufacturing plants and warehouses by 300 NPA Compliance Div. investigators, it was found that on the average the American industrialist is trying to play ball. But, where violations exist, NPA will get tough and use its authority to bring about full prosecution.

At a press conference at the New York regional offices of the NPA, Mr. Robert H. Winn, assistant general counsel of the Compliance Div., stated that "While there are, of course, always some chiselers," he said, "general compliance with NPA orders and regulations has been good. More than 95 pct of American businessmen have shown themselves to be patriotic and willing to cooperate."

NPA To Begin Audit—Mr. Winn announced that the regular staff of 300 investigators has already begun the task of auditing the NPA records and inventories of industry and as soon as necessary appropriations are approved this staff will be augmented.

Mr. Winn said that, as far as possible, NPA would rather have the investigators follow an educational program and that their policy "is primarily to assist and not to harass industry in complying with NPA regulations." In cases of misuse of defense rated orders the educational theme is followed first, with the violator accepting cutbacks until his inventories prove to be in line with production orders. Where evidence warrants, however, NPA will not hesitate to ask the Justice Dept. to take criminal action, with jail sentences of 1 year or a fine of $1,000, or both, for each violation.

Gray Market Operations—Some existing gray market operations have been revealed to investigators as a result of checking trade paper advertisements. Mr. Winn indicated extensive investigations led his men to junk dealers, advertising World War II surplus; manufacturers with "short length" scrap; warehousemen and brokers who advertised materials on which they had options with others who had options—on other options—on material which was still overseas.

Adjusting inventories by ordering cutbacks will put that much material back in supply, Mr. Winn stated. But he acknowledged that this would not make up existing shortages.

The new Class B program of NPA should "be a shot in the arm for the small manufacturers until they can prepare themselves for defense work or subcontracting," the NPA counsel said. However, he could see no let up in demand for the rest of 1951 or well into 1952.

Vote on Freight Charges

Senate has agreed to vote Aug. 3 on legislation authorizing manufacturers to absorb freight charges.

Businessmen would be required, however, to show that freight absorption was made independently and in good faith to meet the equally low price of a competitor.

Senator Long, D., La., one of the principal opponents of the bill, says its enactment would enable larger firms to drive small competitors out of business. He has hinted that he may filibuster against final passage of the bill.

Nonferrous Rollbacks Beat July 1 Deadline

Secondary and scrap lead and aluminum prices slashed . . . OPS fears total loss of rollback power, hustles as ban nears . . . Industry fairly satisfied—*By Bob Hatschek.*

When Congress voted to extend controls through July yet banning price rollbacks it started a flurry of activity in OPS. Some secondary metal prices had gotten so far out of kilter with new metal prices that something *had* to be done.

Nickel and zinc scrap rollbacks came first. Then copper and brass scrap prices were adjusted after Washington lawyers had kicked those orders around for 3 months after they were ready. Industry waited long and impatiently for CPR 46 and 47.

Scrap Too High—Secondary aluminum ingot makers were screaming for relief, as were the brass mills. The earlier price freeze had leveled out secondary ingots at a point well above new metal, but under the provisions of the earlier law scrap prices were too high for economic operations. Lead scrap was in the same fix.

Then, with pressure mounting from some groups for the elimination of price rollbacks and the first murmurings of peace talks in Korea being heard, Congress put a July 1 deadline on price rollbacks which was to extend at least until the end of July. Under these circumstances OPS really got on the ball and issued CPR 53 on lead and 54 on aluminum right under the wire. The effective date of both was June 29.

Ingot makers have until Aug. 13 to clean up orders based on higher-priced scrap and the scrap industry has until July 14 to finish up higher-priced contracts placed prior to June 29. There have been a few gripes because the orders were given after business hours on June 29, thus making them retroactive for that date, but it is felt that any deals made then will be allowed.

Seems to Satisfy—The aluminum order is about what industry was expecting and it seems to satisfy them pretty well. There has not yet been much time for study of operations but at present it seems that there is an adequate margin left for profit between scrap and ingot prices. And the new prices are definitely in accordance with virgin metal prices.

It is expected that there will be added difficulty now and for a couple of months but it is hoped that scrap sources will not dry up too much at the lower prices. Ingot makers feel that the new prices are "better in the long run" for their business. (For latest prices see page 157).

Alternating Units Saves Downtime

Alternating the use of two rotary straighteners, downtime in seamless tube manufacture has been minimized at the No. 3 hot mill in the Allenport, Pa., plant of Pittsburgh Steel Co.

While one machine is in the production line, between cooling table and cut-off unit, the other straightener is at the maintenance shop for major overhaul. In this way a switch of machines can be made in 3 or 4 days downtime instead of 7 to 10 days if repairs were to be made in the production line.

Asks U.S. Raw Materials Help

The U. S. was called upon to make greater industrial sacrifices to permit European countries to get needed raw materials for double loads of defense and civilian production. Andre Philip, of France, also emphasized the importance of Europe's exporting greater amounts of steel and machines to pay for their imports.

He spoke at the sixth session of the Economic Commission for Europe at Geneva. Mr. Philip said a need existed for international pooling of raw materials, allocations, and stabilization of prices.

Strikes Increase in May

Plant strikes showed an increase in May, amounting to 400, an increase over each of 3 past months, the Bureau of Labor Statistics reports. However, total strike idleness as measured in man-days decreased.

May Iron & Steel Production by Districts

As Reported to American Iron & Steel Institute

BLAST FURNACE —NET TONS DISTRICTS	Number of Companies	Annual Capacity	PIG IRON May	PIG IRON Year to Date	SPIEGEL, FERRO-MANGANESE May	SPIEGEL, FERRO-MANGANESE Year to Date	TOTAL May	TOTAL Year to Date	Pct of Capacity May	Pct of Capacity To Date
Eastern	12	13,870,680	1,186,547	5,677,693	27,398	135,940	1,213,945	5,813,633	103.0	101.3
Pitts.-Yngstn.	17	27,070,520	2,255,733	10,789,000	22,336	123,583	2,278,069	10,912,583	99.0	97.4
Cleve.-Detroit	6	7,110,600	616,107	2,804,527	.....	.....	616,107	2,804,527	102.0	95.3
Chicago	7	15,684,040	1,328,138	6,126,126	.....	5,694	1,328,138	6,131,820	99.7	94.5
Southern	9	5,310,740	470,631	2,210,645	5,626	43,010	476,457	2,253,655	105.6	102.5
Western	4	3,425,200	260,644	1,223,129	.....	.....	260,644	1,223,129	89.6	86.3
Total	38	72,471,780	6,117,800	28,831,120	55,560	306,227	6,173,360	29,139,347	100.3	97.1

STEEL —NET TONS DISTRICTS	Number of Companies	Annual Capacity	TOTAL STEEL (Incl. Alloy Steel, Carbon Ingots) May	TOTAL STEEL Year to Date	Pct of Capacity May	Pct of Capacity To Date	ALLOY STEEL May	ALLOY STEEL Year to Date	CARBON INGOTS May	CARBON INGOTS Year to Date
Eastern	25	20,823,230	1,736,447	8,608,642	98.1	99.9	151,084	701,223	322,406	1,626,418
Pitts.-Yngstn.	34	41,411,870	3,557,520	17,060,985	101.1	99.5	497,582	2,378,779	432,828	2,007,098
Cleve.-Detroit	8	9,601,940	849,149	3,992,734	104.1	100.5	76,775	313,804	115,059	506,262
Chicago	15	21,522,750	1,976,248	9,328,454	108.1	104.7	148,770	732,122	279,639	1,343,327
Southern	9	4,913,340	457,362	2,147,679	109.6	105.6	5,760	26,380	2,182	17,220
Western	11	5,956,520	517,773	2,476,449	102.3	100.5	10,541	53,508	35,438	163,118
Total	81	104,229,650	9,094,499	43,614,943	102.7	101.1	890,512	4,205,816	1,187,552	5,663,443

Tool Builders Caught In Rollback Confusion

Machine tool builders are bearing a heavy share of confusion resulting from nullification of rollbacks . . . For them at least Congress' good intentions have backfired.

Machine tool builders and manufacturers under CPR 22 were last week stuck in the quagmire of confusion resulting from Congressional nullification of rollbacks scheduled for July. Some industrialists were glad that controls had lost footing but on the other hand they were forced to shelve temporarily fine plans for subcontracting to yield a substantial spurt in production.

It was believed that some early-bird firms had complied with CPR 30 previously and were thus in a position to price under its provisions. OPS, however, was skeptical that these were in a sufficient number to cause serious dislocation.

Rumors had it that Mobilizer Wilson was poised at his desk, pen in hand, ready to draft another order to rid the machine tool people of their production shackles. Those who knew the delaying tactics of Washington did not doubt Mr. Wilson's good intentions but still saw any kind of an order only in the distance.

But time is short and the defense program is at stake. Something must be done to speed up machine tool building.

Who Can Use CPR 30—OPS issued a legal interpretation spelling out the conditions under which machine-tool builders and manufacturers may avail themselves of the price increases permitted by CPR 22 and CPR 30.

In order to price under CPR 22 or 30, a seller must have exercised his option to put the regulation into effect on or before June 30. How can a seller show that he put CPR 22 or 30 into effect on or before this date? OPS says the official answer is this:

He must do this by showing that on or before June 30 he had both complied with the requirements of the regulation and had taken action to put it into effect prior to July 1, or by other action, such as actual written notification to OPS to his customers that he was putting the regulation into effect prior to July 1.

OPS points out that a necessary prerequisite to putting CPR 22 or 30 into effect in the case of price increase was that a Form 8 be filed more than 15 days prior to putting the increase into effect. This means that no seller can be said to have put either regulation into effect on or before June 30 who did not receive a return receipt or other acknowledgment showing that his Form 8 proposing a price increase had been received prior to June 15.

Canadian Firms Under NPA

Amendment of CMP Reg 3 places Canadian defense industries covered by existing NPA orders and regulations under CMP on the same basis as United States manufacturers.

Canadian firms normally qualifying for use of DO-47 ratings may now obtain CMP allotments for controlled materials and a DO rating with allotment number for non-controlled goods.

This also applies to MRO supplies and minor capital additions. All the outstanding third-quarter MRO orders will be automatically considered CMP orders but those already placed for fourth-quarter delivery must be converted to CMP status on or before Aug. 15.

Industry Controls This Week:

NPA Orders

M-68, Amendment — Adds aluminum castings and forgings to materials limited in auto production. Effective immediately.

M-14, Continues—Limits use of primary nickel for nonrated orders to 65 pct.

M-66—Third quarter allocation of graphite and carbon anodes postponed until Aug. 1. Will also control priority order sequence in July.

M-25, Revision—Establishes time quotas and preference ratings on cans made of blackplate. Effective immediately.

CMP Reg. 3, Amendment—Canadian industry covered by NPA orders placed on same basis as U. S. manufacturers. Effective immediately.

CMP Regs. 5 and 7 replace NPA Reg. 4 which was revoked. MRO supply acquisition is placed under CMP.

M-4, Revised—Tighter restrictions

Total CMP Moves a Step Nearer

New indication that all-out CMP is near came over the weekend when NPA announced that fourth-quarter requirements must be filed by all manufacturers of mass-produced items which use any of the three controlled metals.

This includes automobiles, household appliances, and other durable goods not previously programmed. Exempt are manufacturers using less than 5 tons of carbon or one-half ton of alloy steel, 500 lb of copper, and 500 lb of aluminum per quarter.

This action, NPA officials explained, was just in case "it is decided to include these industries under CMP in the fourth quarter."

Simultaneously, NPA revised its official CMP class B product list, first published May 3, so as to remove the asterisk designations. It is revised in detail with many general product groupings broken down into sub-groups.

on use of pig tin. Effective immediately.

M-9, Revision — Revokes previous percentage rates and places zinc under complete allocation with no deliveries unless authorized by NPA. Effective Aug. 1.

M-70, Amendment—Extends some benefits of CMP to water transportation systems.

M-74, New—Prohibits use of 30 copper and copper base alloys in List A of the order. Assumes many restrictions formerly covered by M-12.

OPS Orders

SR-13, Amendment—Extends ceilings on coke, coal chemicals, and coke oven gas until Sept. 30.

GOR-2, Amend. 1—Eases restrictions on strategic and critical materials bought for government stockpiling.

New NPA Amendment Combines All Limitations of Auto Output

Aluminum castings and forgings have been added to the list of materials which are limited in automobile production through amendment of M-68.

The revision does not change the amount permitted for passenger car production but brings together in one order all use limitations affecting car output.

NPA Regulates Metal Can Use

Effective immediately, NPA has revised M-25 so as to regulate use of metal cans by packers and for the first time under present controls to establish time quotas and preference ratings on cans made of blackplate.

No packer may now accept delivery or use cans for any other purpose than for packing products listed in Schedule 1 of the order and must follow specifications and quotas set in the schedule.

The revised order sets up A and B preference lists and further reduces permitted use for products such as beer and pet foods from 75 to 70 pct.

BASIC METALS—What the Programs Will Get

DPA determines amounts for third quarter output . . . Represent authorized levels . . . Are exclusive of allotments to Defense Dept. and AEC . . . NPA estimates civilian consumption.

Program determinations have been made by DPA governing the use of steel, copper, and aluminum for third quarter production.

These figures represent the authorized levels of permitted procurement for all consumption of the controlled metals. They are based on an estimated third quarter production of 20,825,000 tons of steel, 598,000,000 lb of aluminum, and 1,114,000,000 lb of copper by all producers.

WHAT INDUSTRIES GET

Third Quarter, 1951, Program Allotments of Copper, Steel and Aluminum

	COPPER In Thousands of Pounds	STEEL Tons	ALUMINUM In Thousands of Pounds
ESTIMATED SUPPLY	1,114,000	20,825,000	598,000
Allotments to Claimant Agencies and Miscellaneous			
CAA & CAB (airports)	271	2,782	23
DEPA (construction)	77,000	300,000	38,000
DSFA (coke oven)	624	22,635	....
FSA (construction)	5,200	175,840	550
Maritime Adm.	5,500	110,000	300
PAD	10,100	1,593,000	600
Federal Airways	200	285	13
Public roads	750	300,000	....
Other construction	31,000	1,271,641	8,000
NPA INDUSTRY DIVISIONS			
Agricultural machinery	8,619	673,723	6,774
Aircraft (civilian)	500	13,000	4,228
Building materials	69,156	1,374,416	79,993
Chemicals	172	....	3,322
Communications equip.	53,670	67,700	2,618
Construction, mining machinery	7,721	763,500	2,375
Consumer durables	17,270	337,851	8,059
Containers, packaging	157	1,647,910	4,878
Electrical equipment	131,497	566,410	26,488
Electronics	24,360	52,500	13,200
Engines & turbines	12,720	621,350	3,271
General components	169,679	1,147,750	13,940
General industrial equipment	111,131	1,715,500	37,455
Leather	248	5,689	653
Lumber	47	29,981	254
Motion picture	1,862	8,909	2,810
Motor vehicles	122,214	1,897,601	64,301
Ordnance & shipbuilding	8,999	164,269	1,189
Railroad equip.	37,385	882,417	6,300
Rubber	4,568	34,246	312
Scientific, technical equipment	50,445	94,500	14,700
Service equip.	2,527	37,295	3,710
Mining	3,037	104,818	188

Nondefense Consumption—NPA believes this distribution will still allow nondefense consumption to roll along at the following fixed percentages of base period levels: steel for consumer durables, other than automobiles, 70 pct; consumption of aluminum in general, 50 pct; and copper allowance, 60 pct.

Under the steel, copper, and aluminum to be allotted by the NPA under the "motor vehicle" category, there will be a unit limitation of 1.2 million units.

Following are the allotments by DPA for the "more important" third quarter programs, exclusive of allotments to the Defense Dept. and Atomic Energy Commission:

Extend Coke, Chemical, Gas Order

OPS Supplementary Reg. 13 has been amended to extend ceiling price controls over coke, coal chemicals, and coke oven gas until Sept. 30. Originally, SR 13 was intended to expire June 30.

It was believed necessary, according to OPS officials, to extend the life of the regulation to allow time for completion of an industry survey on which a permanent regulatory guide can be based. Preparation of the final regulation will be preceded by meetings of members of industry advisory committees representing branches of the coke, coal chemicals, and coke oven gas industries.

In extending time coverage of SR 13, OPS emphasized that no producer will be permitted to increase his operating margin per ton of raw material carbonized, in the 8-month period ending Sept. 30, to a point higher than that used in the base period of Jan. 1-Dec. 31, 1950.

DEFENSE CONTRACTS

Week of July 12, 1951

Heater, pumps, and tanks—English and Lauer, Inc., Los Angeles

Gages—Crane Co., San Diego

Automotive repair parts—GMC, United Motors Service Div., Detroit 2

Generator—Howard Industries, Inc., Cyclohm Motor Corp., Racine, Wis.

Signal generator—Measurements Corp., Boonton, N. J.

Spare parts — Borg-Warner Corp., Ingersoll Products Div., Kalamazoo, Mich.

Pumps—Aurora Pump Co., New York

Motor generators — Continental Electric Co., Inc., Newark, N. J.

Main circulating pump—Allis-Chalmers Co., Washington, D. C.

Motor generators—Vicker, Inc., Vickers Electric Div., St. Louis

Searchlights — Westinghouse Electric Corp., Washington, D. C.

Differential ass'y—Allis-Chalmers Mfg. Co., Milwaukee

Lathe—Barrett Equipment Co., St. Louis 6

Cargo trailer—Linn Coach and Truck Div., Great American Industries, Inc., Onenonta, N. Y.

Blading material for generator turbine—Commercial Eng. Co., Washington, D. C.

Parts for diesel engines—Cummins Engine Co., Inc., Columbus, Ind.

Parts for electric motors—Westinghouse Electric Corp., Phila. 4

Parts for turbines — Westinghouse Electric Corp., Phila. 4

Parts for diesel engines—The Cooper Bessemer Corp., Mt. Vernon, Ohio

Aircraft spare parts—Lockheed Aircraft Corp., Burbank, Calif.

Aircraft ignition equipment—American Brass Co., Waterbury, Conn.

Special tools—Boeing Airplane Co., Seattle, Wash.

Generator assemblies—DuMont Aviation Co., Long Beach, Calif.

Machy and equipment—Ryan Aeronautical Co., San Diego

Machy and equipment—I. T. E. Circuit Breaker Co., Phila.

Machy and equipment — Aeroproducts Div., Vandalia, Ohio

Engine facilities—Wright Aeronautical Corp., Curtiss Wright Corp., Woodridge, N. J.

Indicator—Eclipse Pioneer, Bendix Aviation Corp., Teterboro, N. J.

Machine tools—New Britain Machine Co., New Britain, Conn.

Engine exhaust—Kindred Aviation Corp., Burbank, Calif.

Machy and equipment—The Budd Co., Phila.

Industrial facilities—The Bullard Co., Bridgeport, Conn.

New Addition to Plant

Construction of a new addition to the plant of the H. M. Harper Co., Morton Grove, Ill., manufacturer of nonferrous and stainless steel fastenings, was recently begun. Scheduled for completion late this year, the new building will increase total floor space to 166,000 sq ft.

The addition will house complete facilities for the reduction of copper, nickel, aluminum and stainless steel wire and bar stock.

OPS in Rollback Doldrums To Hold Status Quo, Continue Studies

Keynote of OPS price-control policy during the current "hold-over" period will be maintenance of the status quo.

Unless Congress acts to alter the essence or application of controls, OPS officials intend to continue examining price trends to learn whether more or fewer regulations are required.

Price Stabilizer Michael V. DiSalle says he will continue to inform Congress of OPS findings in buying and selling trends.

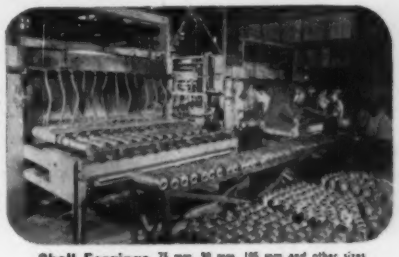
No Signal for Laxity—Any news of a Korean armistice should not be the signal for dropping price controls, DiSalle says. He says there will be "no adequate reason" for shelving controls before 1953. By this date, he estimates, the nation's economy "may be able" to support a large-scale military production effort and also quantity output of civilian consumer goods.

OPS officials emphasize that this month's "hold-the-line" slogan does not necessarily mean there will no price increases. DiSalle's contention is that prices of some products still are below parity. Therefore, he contends, manufacturers of such goods have yet to reach the limit of prices they may assess the wholesaler and the retailer.

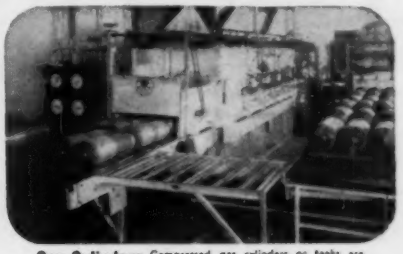
Copper Banned for More Products

A new order (M-74) issued last week assumes many of the restrictions on copper and alloys in builders' hardware formerly covered by M-12 and prohibits use of copper and copper base alloys in manufacture of 30 items.

The banned items are in List A of the order.



Shell Forgings 75 mm, 90 mm, 105 mm and other sizes are scale-free hardened, uniformly, automatically and continuously, in these and other EF gas fired installations.



Gas Cylinders Compressed gas cylinders or tanks are continuously normalized and annealed—scale-free, inside and out—in this and other EF gas fired furnaces.

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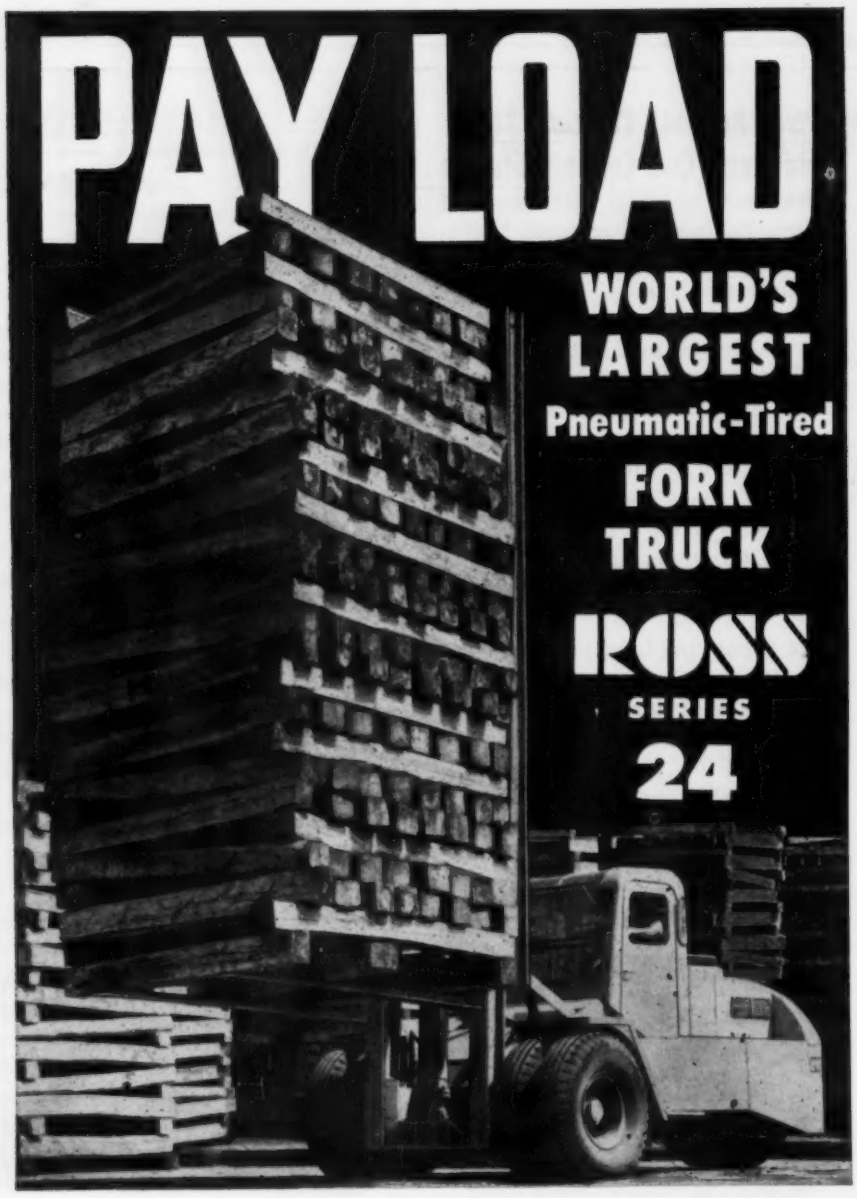

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CMP Allotments for Electric Power Fall Short of DEPA Requests

Increases in third-quarter allotments of CMP materials for the electric power program have been granted by NPA but the totals still fall short of requirements.

An additional 30,000 tons of steel brings the allotment to 300,000 tons, some 37,000 less than requested; another 2,000,000 lb of copper was granted, a total of 77,000,000 lb against the requested 80,000,000; and 13,000,000 lb more of aluminum brings the third quarter total to 38,000,000 lb, compared with the 47,500,000 lb asked.

Applications for allotments for construction of generation, transmission and distribution facilities must be made to DEPA.

Ease Stockpile Price Controls

OPS has eased pricing restrictions on strategic and critical materials purchased by the government for stockpiling.

Effective July 3, sales of strategic and critical materials to the General Services Administration are exempted from price controls when bought from foreign sources. Domestic sales are exempt if GSA certifies that the materials are produced from marginal or submarginal domestic sources or from specially-constructed facilities.

Slab Zinc Under Full Control

Slab zinc has been placed under complete allocation by NPA. Revision of M-9 revokes the previous percentage rate of consumption and directs that beginning August 1, no delivery may be accepted unless authorized by NPA.

Exempted are deliveries to GSA for the stockpile, imports for resale without form changes, and certain small users whose receipts are 20 tons a month or less.

Suspends Scrap Import Tax

President Truman has signed into law legislation (H.R. 3181) continuing the suspension of import duties on metal scrap until June 30, 1952.

Daco to Make Gunfire Controls

Experimental production of small lots of a complex gunfire-control device will begin shortly at Daco Machine and Tool Co. in Brooklyn. Now in the advanced tooling stage, the company expects to be in full production by early fall.

An example of the ultra-precision tooling and production of the gunfire-control, for the Navy, is that assembly will be done in a specially air conditioned portion of the plant which will be electrostatically cleansed.

Several Swiss and American precision machine tools have been added to Daco's facilities as part of their expansion program.

RFC Loans Only for Disaster

RFC Administrator W. Stuart Symington has forbidden regional RFC offices to grant any loans except those for disaster relief.

Regional offices will continue to receive applications but will forward them to Washington for action. Previously, regional officials had authority to make loans up to $100,000 without Washington approval.

Symington said the move was inspired by his wish to get the RFC's lending policy in harmony with anti-inflation program.

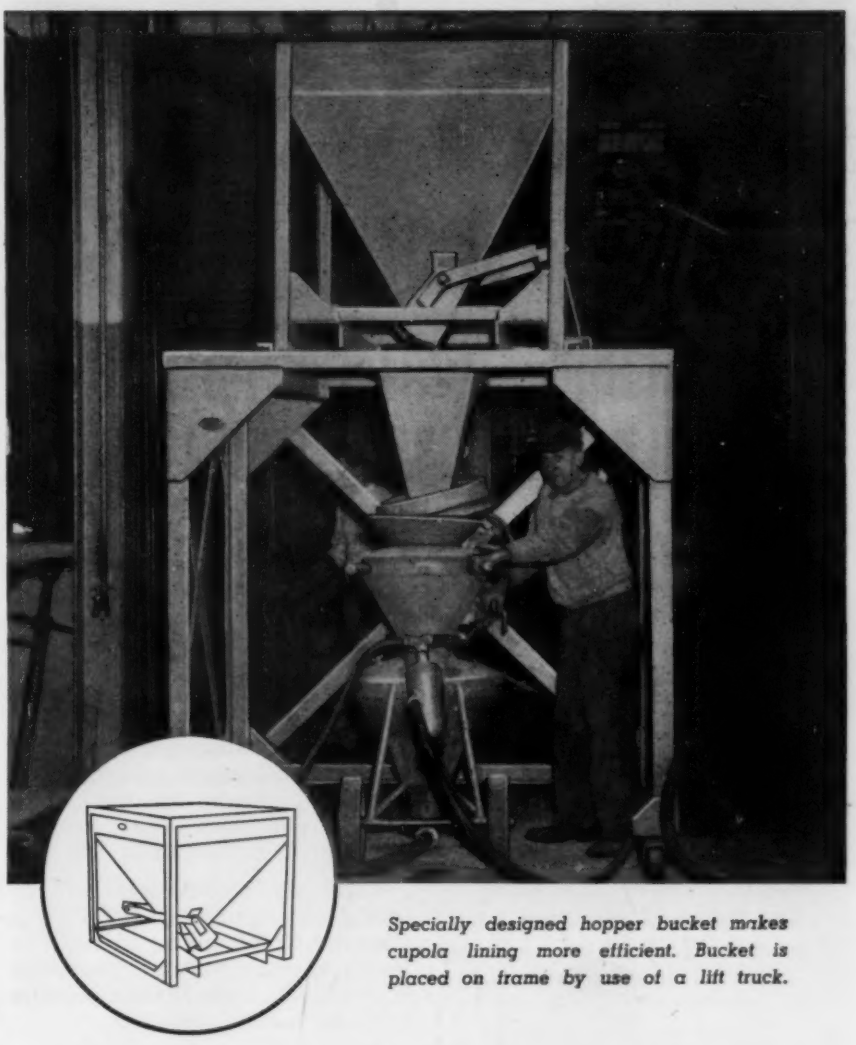
Locking Up Defense Patents

Federal legislation to permit the government to lock up any patent vital to national defense is being backed by Rep. Celler, D., N. Y.

The bill would permit the Secretary of Commerce to seal patent applications earmarked for this disposition by the Atomic Energy Commission, Defense Dept., or other defense agencies.

Helping Hand on Plant Security

Methods of aiding industry in establishing more adequate plant security are being developed by two government boards, Commerce Secretary Sawyer said last week. These will consist of "security



Specially designed hopper bucket makes cupola lining more efficient. Bucket is placed on frame by use of a lift truck.

Solve Your Material Handling Problems With **PENN IRON SPECIAL EQUIPMENT**

In lining cupolas, Textile Machine Works foundry in Reading, Pennsylvania, had difficulty handling the clay mix used with their Bondactor equipment. After a study of the problem, Penn Iron Works, Inc., designed, engineered and manufactured this special hopper bucket for maximum handling efficiency.

Whatever the bulk-material handling problem in your plant, Penn Iron Works, Inc., will be glad to help with its solution. Our wide experience in designing and manufacturing all types of buckets and special handling equipment for foundries can help you cut costs . . . save time . . . increase efficiency.

For Further Information Write:

PENN IRON WORKS, INC.

READING, PENNSYLVANIA

New, Fast, Positive Fire Killer...

DRY CHEMICAL (C-O-TWO) WHEELED PORTABLE FIRE EXTINGUISHER

Experienced engineering develops new, highly efficient 150-pound capacity dry chemical type wheeled portable fire extinguisher . . . has exclusive design that assures you of lasting, foolproof fire protection.

This new fire killer is easy to operate, compact, well-balanced and offers extensive maneuverability indoors or outdoors. Does a highly effective job on flammable liquid, gas and electrical fires, as well as surface fires involving ordinary combustible materials . . . granted unconditional B, C rating by the Underwriters' Laboratories, Inc.

Exclusive design renders constant free-flowing dry chemical . . . fire extinguisher is partially inverted for wheeling, then fully inverted at fire scene, which changes the position of the dry chemical in the tank and thereby provides mechanical breakage. This outstanding mechanical breakage feature, plus a continuous nitrogen pressured agitation or fluffing, together with a skillfully blended free-flowing dry chemical, guarantees a faster, more effective and complete discharge.

Rechargeable on-the-scene . . . no special tools needed . . . C-O-TWO Dry Chemical for recharging packaged in handy 50-pound size, moisture-proof containers . . . spare nitrogen pressure cylinders readily available.

Act now for complete free information on this newest contribution to modern fire fighting. Remember . . . you can't put fire off . . . fire doesn't wait. Get the facts today!

C-O-TWO FIRE EQUIPMENT COMPANY
NEWARK 1 • NEW JERSEY

Sales and Service in the Principal Cities of United States and Canada
Affiliated with Pyrene Manufacturing Company

MANUFACTURERS OF APPROVED FIRE PROTECTION EQUIPMENT

Squeez-Grip Carbon Dioxide Type Fire Extinguishers • Dry Chemical Type Fire Extinguishers
Built-In High Pressure and Low Pressure Carbon Dioxide Type Fire Extinguishing Systems
Built-In Smoke and Heat Fire Detecting Systems

standards" for protection of key industrial plants against fire, sabotage, and leakage of classified information.

The two boards are the Industrial Evaluation Board, set up last January, and the Facilities Protection Board, a more recent organization.

Sweden Rolls Back Iron, Steel

America has no monopoly on inflation. Sweden has reintroduced price controls for pig iron, plates, and other rolled steel products. Prices were rolled back to those prevailing on Dec. 31, 1950.

Swedish iron ore exports last year were 12,900,000 tons as compared with 12,700,000 tons in 1949. Iron and steel exports rose to 216,000 tons from 155,900 tons the previous year.

Fast Tax Write-Offs

178 certificates
issued by DPA during
June 22-29th
totaling $258,512,867
2,310 authorized to date
totaling $7,596,491,379

Latest DPA certificates listed by company, use, amount applied for, amount eligible, and pct approved.

Miller Motor Co., Melrose Park, Ill., hydraulic cylinders, $727,720, $599,752, 80.

American Zinc Co. of Ill., Dumas, Tex., precipitator dust, $407,026, $407,026, 60.

Motor Tug Frederick Beuchard, Inc., New York, Diesel tug, $210,000, $210,000, 70.

P. R. Hoffman Co., Carlisle, Pa., piezoelectric blanks, $178,908, $178,908, 80.

Aluminum Industries, Inc., Cincinnati, Ohio, ordnance, $310,317, $310,317, 85.

McDonnell Aircraft Corp., Robertson, Mo., airplanes, $139,672, $94,631, 75.

Superior Valve & Fittings Co., Pittsburgh, cylinder valves, $11,389, $11,389, 90.

American Saw & Mfg. Co., East Longmeadow, Mass., metal cutting saws, $665,700, $665,700, 80.

Keystone Wire Cloth Co., Hanover, Pa., metal insect screening, $130,024, $130,024, 60.

W. H. Barber Co., St. Paul, Minn., storage for gasoline, $218,883, $210,702, 50.

Furnace Engineers, Inc., Pittsburgh, furnaces, $174,000, $154,000, 70.

Afran Brothers Co., Milwaukee, scrap, iron and steel, $51,750, $51,750, 75.

Ace Tool & Die Co., Detroit, milling machines, $619,900, $333,600, 80.

The Fafnir Bearing Co., New Britain, Conn., ball bearings, $5,982,715, $5,982,715, 85.

Emerald Coal and Coke Co., Millsboro, Pa., coal, $1,650,000, $1,650,000, 65.

Emerald Coal and Coke Co., Greene County, Pa., coal, $950,000, $950,000, 65.

Universal Exploration Co., Birmingham, Ala., zinc concentrates, $1,200,000, $1,087,000, 60.

The New York Air Brake Co., Watertown, N. Y., hydraulic pumps, $60,600, $60,600, 60.

Southern Pacific Co., San Francisco, railroad service, $21,551,539, $21,551,539, 65.

Ford Motor Co., Dearborn, Mich., water transportation, $5,350,000, $5,350,000, 80.

Owensboro Forging Co., Owensboro, Ky., forgings, $371,000, $371,000, 80.

Southwestern Public Service Co., Amarillo, Tex., electric energy, $4,394,169, $4,394,169, 25; $263,568, $263,568, 25.

Schwien Engineering Co., Los Angeles, aircraft, $425,000, $350,000, 75.

Molded Insulation Co., Philadelphia, cable connectors and radiosonde equipment, $380,000, $370,000, 75.

American Car & Foundry Co., St. Louis, transportation-freight cars, $370,336, $370,336, 60.

Henry Miller Spring & Mfg. Co., Pittsburgh, railroad springs, $96,500, $89,300, 60.

Buck Engr. Co., Inc., Freehold, N. J., oscillator, $4,247, $4,247, 85.

Joseph A. Kramer, Plastic Age Co., San Fernando, Calif., aircraft, $22,000, $22,000, 75.

The New York Air Brake Co., Watertown, N. Y., locomotive brakes, $456,702, $456,702, 60.

Douglas Aircraft Co., Inc., El Segundo, Calif., airplanes, $494,318, $453,221, 75.

Wyatt, Inc., New Haven, Conn., storage (fuel oil), $190,000, $190,000, 50.

American Smelting & Refining Co., Corpus Christi, Texas, special high grade zinc, $67,000, $67,000, 60; zinc, $745,000, $745,000, 60.

American Smelting & Refining Co., Amarillo, Texas, zinc metallica and fines, $58,500, $58,500, 60.

American Smelting & Refining Co., Selby, Calif., lead bullion, copper and bismuth, $110,000, $110,000, 60.

Guardian Electric Mfg. Co., Woodstock, Ill., electrical equipment, $224,085, $213,850, 75.

The Hydraulic Press Mfg. Co., Mount Gilead, Ohio, hydraulic presses, $187,437, $187,437, 85.

Maine Specialty Co., South Portland, Maine, Turnbuckles, bolts, $33,763, $33,763, 75.

Kopelove Iron and Metal Co., Dayton, Ohio, overhead crane, $45,672, $45,672, 75.

The New York, New Haven RR Co., New Haven, Conn., transportation-rail, $9,255,578, $1,341,738, 80; $5,656,300, 65.

The Pipe Machinery Co., Wickliffe, Ohio, gages, $367,000, $210,000, 75.

Webster Electric Co., Racine, Wis., ordnance, $750,000, $750,000, 75.

Potomac Electric Power Co., Washington, D. C., electric power generation, $9,000,000, $9,000,000, 60.

The Cleveland Electric Illumination Co., Cleveland, electricity, $19,619,495, $19,619,495, 25.

Northern States Power Co., Sioux Falls, S. D., electric power, $3,320,100, $3,320,100, 25.

Northern States Power Co., Mankato, Minn., electric power, $1,662,350, $1,662,350, 25.

The Fosdick Machine Tool Co., Cincinnati, metal drilling machinery, $305,566, $112,000, 80.

Groov-Pin Corp., Ridgefield, N. J., pins, studs, inserts, $482,150, $460,000, 80.

Jaffe-Wohl Iron & Metal Co., Birmingham, Ala., scrap steel, $17,442, $17,442, 75.

Superior Gear Co., Inc., Birmingham, Ala., gears, pinions, $50,526, $50,526, 90.

The Queen City Steel Treating Co., Cincinnati, heat treatment, $160,000, $130,000, 75.

The Levinson Steel Co., Pittsburgh, steel parts, $1,057,500, $985,000, 60.

The Babcock & Wilcox Co., Alliance, Ohio, steam boilers, $115,577, $115,577, 60.

American Iron & Metals, Inc., Dallas, scrap iron, $494,000, 494,000, 75.

American Iron & Metals, Inc., Shreveport, La., scrap iron, $444,000, $444,000, 75.

Bendix Aviation Corp., Sidney, N. Y., aircraft magnetos, $542,600, $463,373, 85.

Sonnet Supply Co., Hawthorne, Calif., cutting tools, $61,289, $61,289, 80.

Standard Oil Co. of Calif., Richmond, Calif., aviation gasoline, $9,000,000, $9,000,000, 70.

Scott & Williams, Laconia & Lakeport, N. H., torque unit, $7,059, $7,509, 85.

Republic Steel Corp., Youngstown, Ohio, steel ingots, $125,000, $125,000, 75.

International Harvester Co., South Chicago, Ill., steel bars, $1,050,744, $1,050,744, 60.

Keystone Steel & Wire Co., Peoria, Ill., steel wire, $336,000, $336,000, 60.

The Timken Roller Bearing Co., Zoerville, Ohio, roller bearings, $52,732, $52,732, 85.

The Timken Roller Bearing Co., Canton, Ohio, steel bars, $301,330, $301,330, 60; $856,900, $856,900, 60.

The National Supply Co., Terrance, Calif., ordnance, $57,283, $48,677, 90.

General Cable Corp., Bayonne, N. J., electrical cable, $2,550, $2,550, 60.

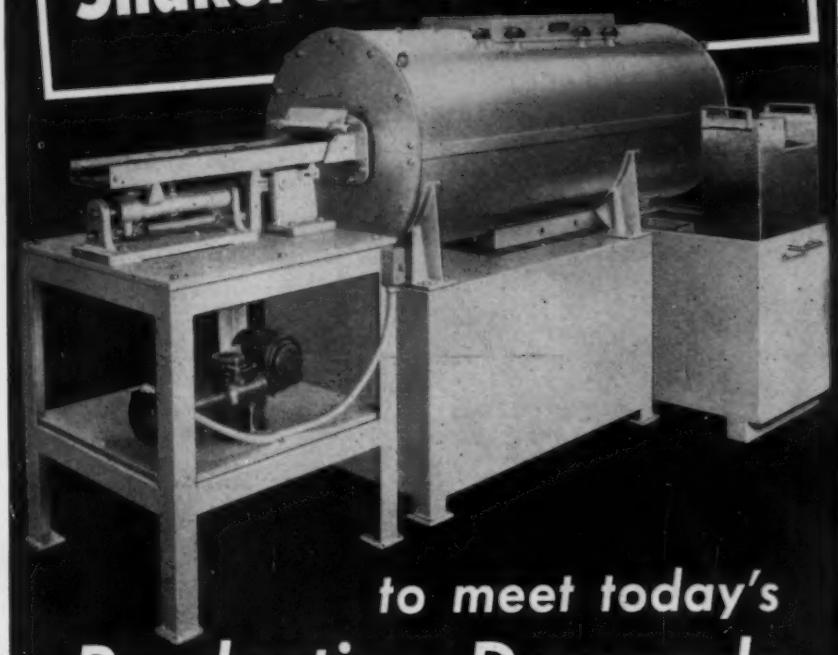
Cincinnati Steel, Cincinnati, steel scrap, $52,583, $10,646, 75.

Curtiss-Wright Corp., Caldwell, N. J., flight trainers, stimulators, radio aid units, $97,080, $70,137, 85.

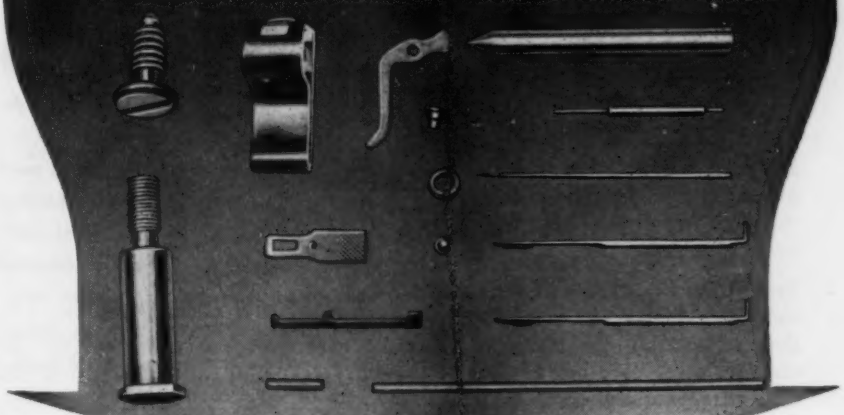
The Dow Chemical Co., Freeport, Texas, power for magnesium production, $640,630, $640,630, 50.

Middleton Steel Corp., Stamford, Conn., processing of steel, $1,633,437, $1,614,737, 60.

use this HEVI DUTY
Shaker Hearth Furnace



to meet today's
Production Demands



Hevi Duty Shaker Hearth Furnaces are used to bright carburize, bright dry cyanide or bright harden these small parts without distortion. Shaker Hearth furnaces process up to 150 lbs. per hour. Case depths are accurately controlled, and results are uniform. Learn more about this versatile Hevi Duty furnace.

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HEAT TREATING FURNACES HEVI-DUTY ELECTRIC EXCLUSIVELY

DRY TYPE TRANSFORMERS — CONSTANT CURRENT REGULATORS

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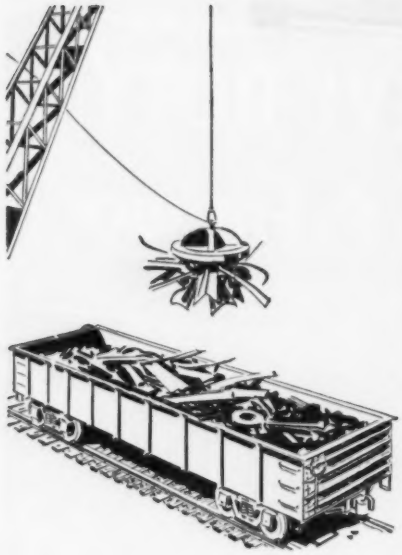


HOW TO MAKE SILVER AND STEEL FROM RUSTY IRON...

Rusty iron, outdated and idle dies and machinery, production scrap . . . they're all good for dollars when you sell them to your scrapmetal dealer.

What's more . . . they help make more steel . . . and you know how tight the steel supply is today. Every ton of scrap you turn in helps make 2 tons of new steel.

Tell your department heads *today* to gather up the scrap in their sections . . . get idle and obsolete machinery out of the dark corners and on its way to the scrap dealers . . . return production scrap and shearings promptly.

Look in the yellow pages of your telephone book for the name of a scrap dealer . . . he's paying top prices for good scrap.

REPUBLIC STEEL

REPUBLIC STEEL CORPORATION
General Offices • Cleveland 1, Ohio

• News of Industry •

Linear, Inc., Philadelphia, cylinder seals, $645,500, $625,000, 80.

The Potomac Edison Co., Williamsport & Reid, Md., electric power, $489,050, $484,050, 25.

Tennessee Products & Chemical Corp., Chattanooga, ferrosilicon, $958,790, $958,790, 85.

Monongahela Power Co., Willow Island, Williamstown, Rivesville, and Fairmont, W. Va., electric power, $34,504, $34,504, 25; $47,790, $47,790, 25; $12,097,800, $12,097,800, 25.

Marietta Electric Co., Marietta, Ohio, electric power, $177,282, $177,282, 25.

A. Finkl & Sons Co., Chicago, steel blocks and forgings, $1,500,000, $1,468,000, 75.

The Youngstown Foundry & Machine Co., Youngstown, Ohio, iron castings, $233,687, $233,687, 75.

Union Carbide & Carbon Corp., Bishop, Calif., calcium tungstate, $533,200, $460,700, 85.

Woodward Iron Co., Woodward, Ala., pig iron, $780,000, $780,000, 85.

Allegheny Ludlum Steel Corp., Breckenridge, Pa., silicon laminations, $1,244,495, $1,154,495, 40.

A. Marx and Sons Co., Inc., New Orleans, scrap steel, $38,000, $38,000, 75.

The American Steel & Wire Co., Cleveland, steel inogts, $1,045,379, $1,045,379, 60.

Quaker City Gear Works, Philadelphia, precision gears, $346,525, $236,696, 80.

Crucible Steel Co. of America, New York, pig iron, $431,092, $359,244, 75.

Metalee, Inc., Jackson, Mich., tube fittings, $19,864, $19,475, 60.

The Fafnir Bearing Co., New Britain, Conn., ball bearings, $2,111,590, $2,016,690, 85.

Abrams Metal Co., Philadelphia, steel scrap, $107,000, $45,000, 75.

Curtiss-Wright Corp., Caldwell, N. J., aircraft, $1,164,869, $1,126,818, 80.

Hartford Machine Screw Co., Windsor, Conn., nitriding of steel parts, $9,747, $9,747, 60.

General Electric Co., Schenectady, N. Y., research & development, $41,000, $41,000, 75.

Lindberg Steel Treating Co., Inc., Chicago, heat treating of metals, $32,375, $32,375, 60.

Ganary Brothers, Mt. Ephraim, N. J., ordnance, $14,181, $14,181, 90.

Singer Metal Co., Enid, Okla., scrap iron, $26,081, $26,081, 75.

Wabash Scrap Material Co., Toledo, Ohio, scrap iron, $26,539, $26,539, 75.

Chapin & Fagin, Inc., Buffalo, N. Y., steel scrap, $163,655, $163,655, 75.

American Zinc Co. of Tenn., Friends Station, Tenn., zinc concentrates, $272,846, $267,846, 60.

The Pollak Steel Co., Marion, Ohio, steel bars, $1,883,500, $1,883,500, 60.

Aero Electronics Co., Chicago, velocity indicators, $3,461, $3,461, 85.

Lake Erie Engr. Corp., Tonawanda, N. Y., heavy hydraulic presses, $29,300, $29,300, 75.

Helipot Corp., South Pasadena, Cal., potentiometers, $62,107, $53,623, 85.

Hopoint, Inc., Cicero, Ill., aircraft, $4,020,125, $4,020,125, 75.

The Eagle-Picher Co., Galena, Kan., zinc oxide, $288,500, $288,500, 60.

St. Joseph Lead Co., St. Francois County, Mo., lead ores, $784,760, $784,760, 60.

International Harvester Co., Melrose Park, Ill., ordnance, $2,131,499, $2,131,499, 75.

Fulton Foundry & Machine Co., Inc., Cleveland, castings, $89,900, $89,900, 75.

Webber Gage Co., Cleveland, gage blocks, $22,045, $22,045, 75.

Viking Copper Tube Co., Cleveland, aluminum tubes, $162,088, $162,088, 60.

The H. M. Harper Co., Morton Grove, Ill., bolts, nuts, rivets, $91,000, $91,000, 80.

Libbey-Owens-Ford Glass Co., Toledo, Ohio, ordnance, $592,965, $592,965, 80.

Chicago Heights Terminal Transfer RR Co., Chicago, Ill., transportation-rail, $1,000,000, $1,000,000, 80.

Inland Steel Co., East Chicago, Ind., open hearth steel, $23,248,968, $6,809,386, 70.

St. Joseph Lead Co., Herculaneum, Mo., cadmium, $2,967,200, $2,478,898, 60.

St. Joseph Lead Co., Herulaneum, Mo., lead, zinc and cadmium, $2,967,200, $2,478,898, 60.

Aviation Engineering Corp., Woodside, N. Y., (aircraft) fuel gages, $32,682, $24,046, 85.

Detroit Broach Co., Inc., Fort Lauderdale, Fla., aircraft, $27,680, $27,680, 85.

Corliss Machine Works, Los Angeles, Cal., actuator units, $2,747, $2,747, 75.

Kaiser Steel Corp., Fontana, Cal., pig iron, $54,939,000, $54,939,000, 75.

The Chapin Trucking Line, Inc., Ridgeville Township, Ohio, transportation-truck, $50,000, $35,000, 70.

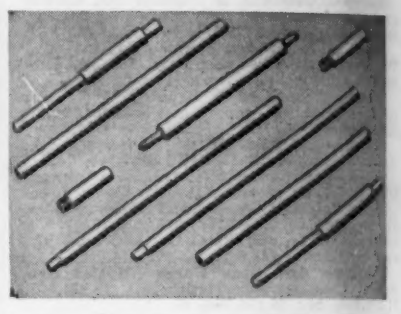
The H. M. Harper Co., Morton Grove, Ill., bolts, nuts (brass), $316,215, $303,433, 80.

American Smelting & Refining Co., Corpus Christi, Tex., electrolytic zinc, $5,854,000, $5,854,000, 60.

PAY LESS

for precision metal parts made by

TORRINGTON



Easy on the Dies

THE ONE-PIECE STEEL SHELL of this handsome air-conditioner is deep drawn from Republic Electro Paintlok. Louvres are stamped, and the unit is finished in durable baked enamel.

The same zinc-coated, chemically-treated surface which gives Electro Paintlok its outstanding ability to *take* and hold paints, lacquers and synthetic enamels, makes it easy on drawing and stamping dies, too. It lubricates dies, stretches their life, gives you added production per grind.

The zinc coating does not flake, crack or peel during drawing and stamping operations. It protects against underfilm corrosion should the painted surface be scratched or broken in service.

Added die life . . . exceptional paint adherence . . . fine surface finish . . . all are qualities Electro Paintlok offers every manufacturer who paints on fabricated steel products. Read all the facts in colorful new Booklet 525. Your request will bring your free copy by return mail.

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IDLE SCRAP slows steel production. Comb your plant today for old machinery . . . then call your scrap dealer.

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PRODUCE MORE WITH YOUR AUTOMATICS . .

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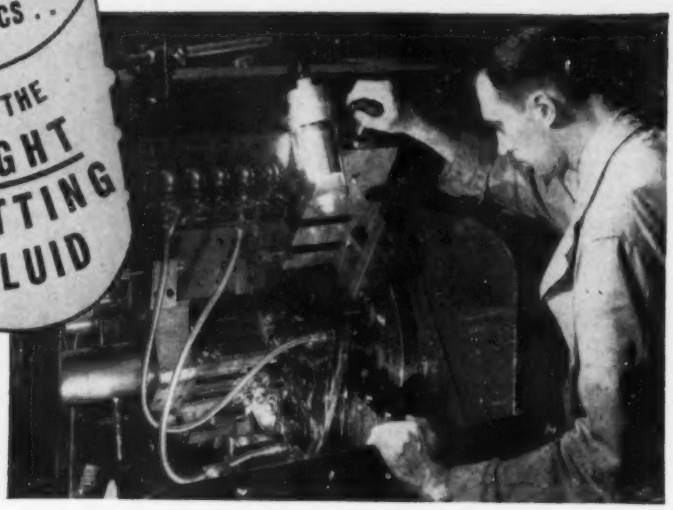


▼ **STUART'S THREDKUT 99 MORE THAN DOUBLES TOOL LIFE PER GRIND.** In threading type 310 stainless male pipe union sections on large automatics, a Milwaukee plant was getting 136 pieces per tool grind. A change to Stuart's ThredKut 99 increased this to 310 pieces per grind —and the cost was 3c less per gallon for oil.

▼ **FORM TOOL LIFE INCREASED 36% WITH STUART'S SPEEDKUT B**—on 6 spindle automatics forming and threading cut-off cap screws of SAE 1060, 10-17 Rockwell C.

▼ **4 TO 1 LESS MACHINING DOWNTIME WITH SPEEDKUT B.** After changing to this Stuart product on an automatic turning out worm gear blanks, the customer reports, ". . . machine now made available to more production within its capacity."

ARE YOU really getting the capacity that was built into your automatic screw machines? In shop after shop, Stuart oils correctly applied have upped production substantially and, as a by-product, have usually improved quality and increased tool life.

It is worth finding out what a Stuart Representative can accomplish for you. Ask to have him call and SEND FOR EDUCATIONAL LITERATURE on cutting fluids for screw machines.

D.A. Stuart Oil Co.
EST. 1865 LIMITED

2737 S. Troy St., Chicago 23, Ill.

STEEL CONSTRUCTION NEWS

Fabricated steel awards this week included the following:

1500 **Tons,** Gilmerton Vam-power station for the Virginia Electric & Power Co. through Stone & Webster Engineering Corp., Boston, to Bristol Steel & Iron Co., Bristol, Tenn.

525 **Tons,** Dover, Del., Pittsburgh and Newcastle, Pa., three hangars for U. S. Army Corps of Engineers, to American Bridge Co., Pittsburgh.

510 **Tons,** Philadelphia, arresting gear foundation at Philadelphia Navy Yard, Hughes-Foulkrod Co., general contractors, same city, to American Bridge Co., Pittsburgh.

410 **Tons,** Johnsville, Pa., additions to Naval Air Development Station, McCloskey & Co., low bidder.

400 **Tons,** Fort Dix, N. J., U. S. Army Corps of Engineers, airmen's mess and alert hangars, Brotherton Construction Co., low bidder.

195 **Tons,** Blount County, Ala., highway bridge, Alabama Highway Department, to Virginia Bridge Co., Birmingham.

150 **Tons,** Parkersburg, W. Va., roof over spinning area, American Viscose Corp., to Bethlehem Steel Co., Bethlehem.

135 **Tons,** New Orleans, La., Metairie Canal bridge, for City of New Orleans, to Virginia Bridge Co., Birmingham.

118 **Tons,** Dallas and Wilcox Counties, Alabama, highway bridge, Alabama Highway Department, to Virginia Bridge Co., Birmingham.

Fabricated steel inquiries this week included the following:

2000 **Tons,** Montgomery County, Pa., highway bridge on LR 769, Sect. 2B, Pennsylvania Dept. of Highways, bids due July 27.

230 **Tons,** Evanston, Ill., Howard St. Bridge.

215 **Tons,** Maywood, Ill., 25th Ave. grade separate for Cook County.

190 **Tons,** Maywood, Ill., First Ave. grade separation.

Reinforcing bar inquiries this week included the following:

350 **Tons,** Fort Wayne, Ind., Park View Memorial Hospital.

320 **Tons,** Williston, N. D., water storage reservoir.

255 **Tons,** Oak Park, Ill., Fenwick High School auditorium.

Reinforcing bar awards this week included the following:

1080 **Tons,** Boston, Boston Central Artery, construction of deck, electrical work and snow melting system. V. Barletta Co., Roslindale, low bidder.

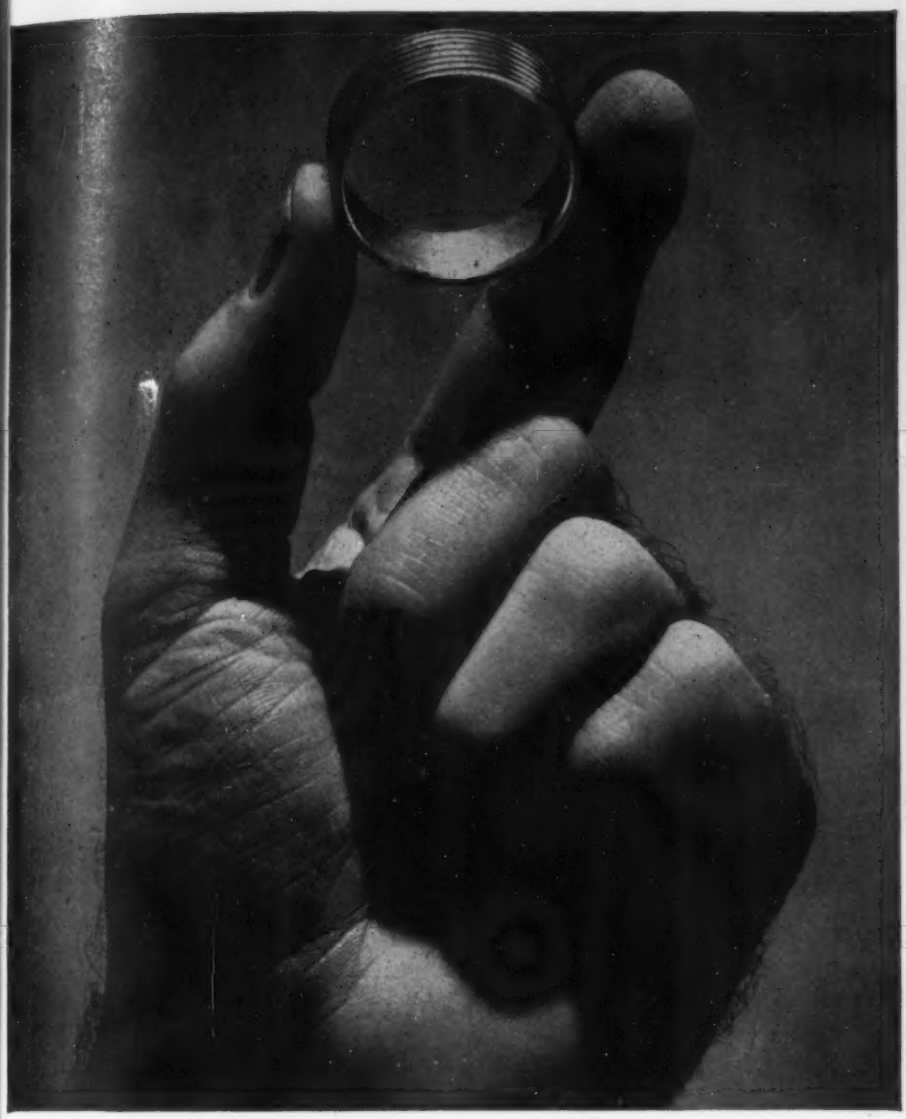
690 **Tons,** Westville, Ind., hospital building to J. J. Duffy Co., Chicago.

175 **Tons,** Evergreen Park, Ill., Water Works, to Northern States Co., Chicago.

140 **Tons,** Boston, dredging river bottom of Fens Pond, filling and construction work, bridge piers and abutments and two culverts. V. Barletta Co., Roslindale, low bidder.

List Chicago Expansion Total

Plans for industrial expansion in the Chicago area during June involved a contemplated investment of $7,555,000 by 29 companies according to the Chicago Assn. of Commerce & Industry. The June investment plans, lower than any previous month this year, brought the total for the first 6 months of 1951 to $219,520,000.



This improved a heart condition

Norton Company, Worcester, Mass., needed a better heart for its grinding wheels—a bushing that would remain true throughout the life of the wheel.

Federal-Mogul Corporation, Detroit, suggested a rolled bushing made of aluminum. Why? Because aluminum is low in cost. Its exceptional workability means precision accuracy vital to dynamic stability of the wheel.

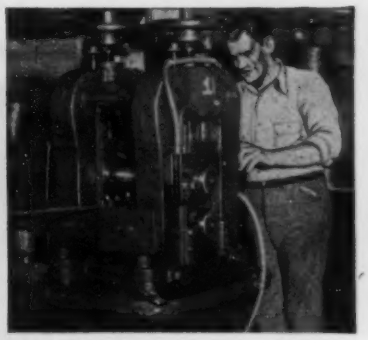
And aluminum's strength means the heart of the wheel *remains* true—perfectly round under heavy load and high speeds!

Today Federal-Mogul is turning out rolled bushings made of Kaiser Aluminum faster than one a second. *Aluminum* means tolerance can be held to within two-thousandths of an inch on the critical inside diameter!

Aluminum may be the answer to *your* design or production problems. Call a Kaiser Aluminum engineer for free technical assistance today. 63 sales offices and warehouses in principal cities. Kaiser Aluminum & Chemical Sales, Inc., Oakland 12, California.

Kaiser Aluminum

Setting the pace . . . through quality and service



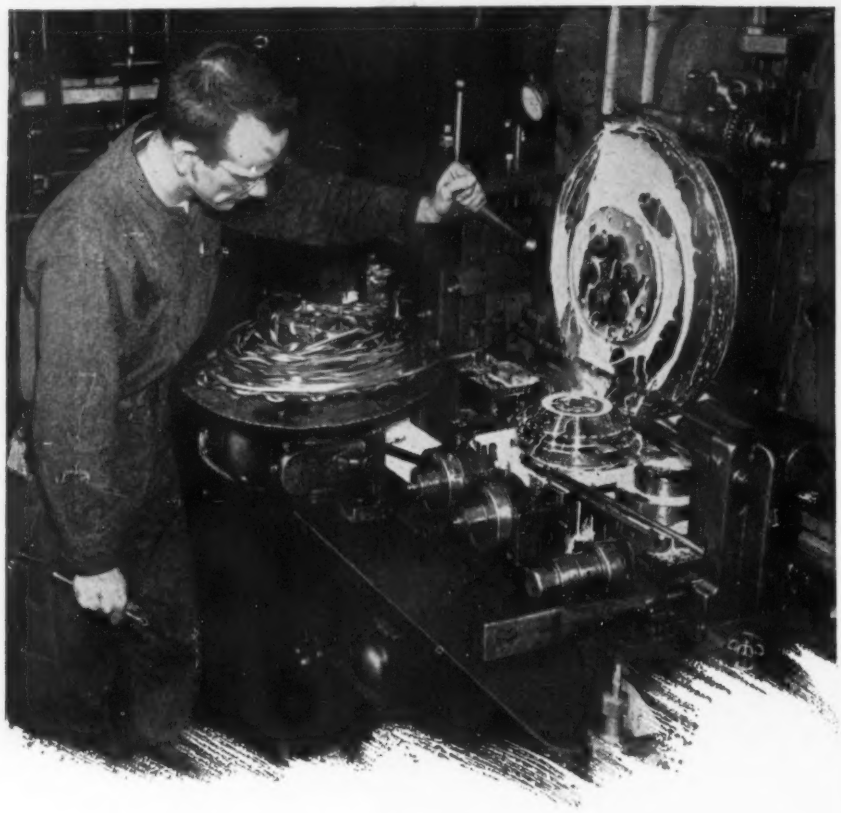
THE EASE of working aluminum enables economical mass production operations. Coils of Kaiser Aluminum are slit, strips cold rolled to exact thickness, outer surface fluted.

WITH ALUMINUM, forming of the bushing is rapid and accurate. Exact lengths are cut from the strip and rolled into round shape, with only a hairline seam showing.

FINAL STEP removes rough edges, making the bushing ready for long service as the heart of a Norton Grinding Wheel. Because they're precision made of Kaiser Aluminum, no further machining is necessary!

WORKING RIGHT ON YOUR producton lines, or across the desk from *your* product engineers, Kaiser Aluminum consulting engineers can give you valuable assistance in product design or development, or in suggesting fabricating or finishing changes.

BRAINARD TUBING IN THE MAKING...



THE WELDING OPERATION involves a split electrode with current passing from one side to the other, heating the tube to welding temperature. The side pressure rolls then force the bond. Excess metal is peeled off, making a clean, neat tube. Busy as we are in times like these, this operation gets careful supervision at Brainard. We have complete control of every operation from ore to tube. That's why it will pay you to call on Brainard first when you have a job for electric welded mechanical tubing. Straight or fabricated. Sizes: ½" to 4"—.025 to 165.

Sales offices: Atlanta, New York, Cincinnati, Pittsburgh, Buffalo, Chicago, Philadelphia, Dearborn, Cleveland, Tonawanda, N.Y., Rochester, Indianapolis, Nashua, N.H. Sales representatives: Sharonsteel Products Co., Dearborn, Mich., Grand Rapids, Mich. and Farrell, Pa. Fred J. Reynolds, Davenport, Iowa. Brass & Copper Sales Co., St. Louis, Mo. and Kansas City, Kan. Julius Schulz, Dallas, Texas.

Brainard STEEL COMPANY WARREN, OHIO

How To Reach Them

The thousands of purchasing executives, production chiefs, and engineers, all potential BUYERS of your products are among the readers of Iron Age. Your advertisement here can pave the way for your salesmen throughout the metalworking industry.

For information write:

THE IRON AGE, 100 E. 42nd St., NEW YORK 17, N. Y.

new equipment

Continued from Page 40

Anti-rust paint

A new penetrating and sealing anti-rust paint can be applied right over rusted surfaces. Suitable for both interior and exterior use, the paint is reputed to be equally effective in preventing rust on new metal or stopping rust action on present rusted metal. PCA-100 can be applied without extensive surface preparation. It penetrates through the rust layer into the base metal and seals the surface against further rusting. *Paint Corp. of America.*

For more data insert No. 13 on postcard, p. 37.

Safety-step ladder

Designed for use with stock carts a 4-step ladder has hangers that are adjustable for push bar heights from 30 to 38 in. and is mounted on ball bearing casters for easy movement without lifting. Casters automatically retract when stock clerk is on the ladder. Stockart ladders are all steel with ¾ in. steel tubing frames and expanded steel non-slip steps. *Ballymore Co.*

For more data insert No. 14 on postcard, p. 37.

Rounded anvil micrometer

A new micrometer is used for measuring the wall thickness of bearings, tubing and various cylinders having walls to 1 in. thick and diameters down to ⅝ in. ID. Since the anvil contact is rounded, the curved surfaces can be accurately measured in thousandths of an inch. The frame is strongly ribbed and finished in black enamel; thimble and sleeve have rust resistant, satin chrome finish. *L. S. Starret Co.*

For more data insert No. 15 on postcard, p. 37.

Synthetic resin cement

Vitroplast, a new light colored synthetic resin cement, is resistant to many acids, solvents, greases and oxidizing agents. It sets hard in contact with concrete and metals and exhibits excellent adhesion properties for the jointing of brick and tile and adhering glass, concrete, metal and other materials. *Atlas Mineral Products Co.*

For more data insert No. 16 on postcard, p. 37.

Turn to Page 130

an

official scrap sleuth

is going to call on you

Please give him your cooperation for he is working in the interests of the National Scrap Drive.

More than 70 Solar salesmen in our seven divisions are going to visit all customers within the next 60 days and offer to work with them to locate saleable scrap in their plants.

These men are going to put 8 hours a day into this effort which amounts to more than 560 hours per day of Scrap Sleuthing by our sales force.

We think it is of prime importance that such efforts be made to increase the scrap inventory at the steel mills and help them maintain schedules for increased amounts of steel. We will greatly appreciate any courtesies and cooperation manufacturers extend to Solar Scrap Sleuths.

SOLAR STEEL CORPORATION

SURE® SPEC — DEPENDABLE AS THE SUN — STEEL SERVICE

General Offices: UNION COMMERCE BUILDING, CLEVELAND, OHIO

PLANTS — Chicago • Cincinnati • Cleveland • Detroit • Philadelphia • Union, N. J.

SALES OFFICES — Chicago • Cincinnati • Cleveland • Detroit • Grand Rapids • Kalamazoo • New Haven
Philadelphia • Rochester, N.Y. • Toledo • Union, N. J.

Tool Saving Tips

#3 OF A SERIES

USE KENNAMETAL MECHANICALLY HELD TOOLS

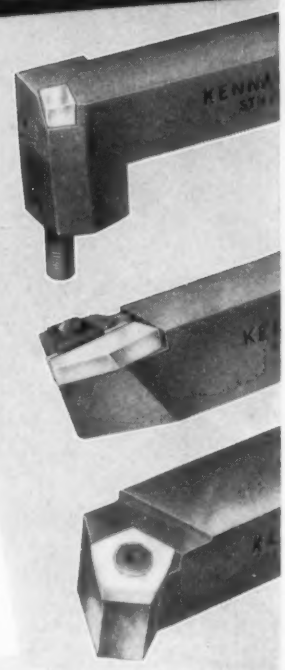
SAVE STEEL
Solid heat-treated shank resists chip erosion —serves as permanent tool holder

SAVE INVESTMENT
Tool is suitable for cutting variety of metals, by using insert of proper Kennametal grade

SAVE GRINDING WHEELS
Grinding is simpler—less frequently required. No steel to grind

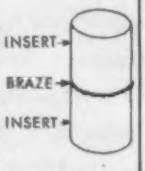
SAVE CARBIDE
Mechanical-holding prevents brazing strains —insures best service from Kennametal

SAVE "CRITICALS"
The mechanically-held technique enables you to get the best possible service from all tooling elements, thereby conserving materials, machine-time, and man-hours



HOW TO S-T-R-E-T-C-H KENNAMATIC INSERTS

When Kennametal inserts have been reground many times and have become too short for effective clamping, simply braze two "used" pieces end to end as shown. This permits proper clamping . . . and because Kennametal inserts are uniformly sound from top to bottom you get much more work from each insert.



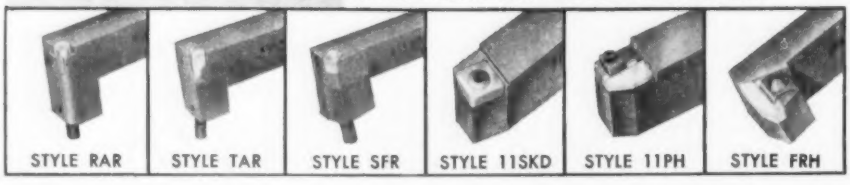
The ruggedness, strain-free assembly, and convenience of mechanically-held Kennametal tools enable them to do many jobs that brazed tools cannot do . . . or to do them faster at less cost.

Standard Kennametal tools will handle the majority of these jobs . . . and the basic principles of their design are adaptable to a wide variety of special purpose clamped tools which can be made in your own shop. To assist you we have published a "Clamped Tool Design Manual." Write for a free copy.

Our nearest field engineer can help you use clamped tools most effectively. He represents our organization which pioneered the mechanically-held principle . . . offers you the greatest accumulation of tool-and-time-saving "know-how" available through one source.

KENNAMETAL *Inc.*, Latrobe, Pa.

MANUFACTURERS OF SUPERIOR CEMENTED CARBIDES AND CUTTING TOOLS THAT INCREASE PRODUCTIVITY



new equipment

Continued from Page 126

Break-resistant blade

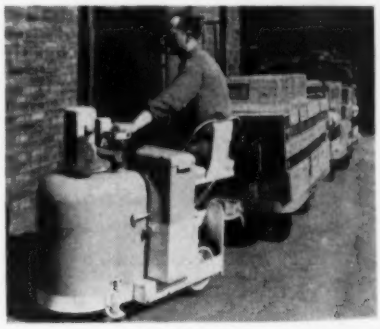
Dropping, twisting in the cut, or bending will not damage a Clipper B-R masonry cutting blade. It is manufactured in layers of glass fiber cloth impregnated with resins and silicon carbide. This material is then pressed together under hydraulic pressure and processed in kilns. Its most effective performance is in the softer range of materials such as dry press refractories, Transite, limestone, light aggregate concrete products. *Clipper Mfg. Co.*

For more data insert No. 17 on postcard, p. 37.

Dry acid cleaner

The reformulation of a pickling and descaling compound may be used in water solutions as a replacement for liquid acids. It is non-hazardous, easy to handle, and gives off no obnoxious fumes. Other advantages claimed are controlled foaming characteristics, freedom from dust, elimination of water or acid spotting, close control of pickling and a simplified waste problem. *Wyandotte Chemicals Corp.*

For more data insert No. 18 on postcard, p. 37.



New industrial tractor

The rider type Tractor Ox is a compact electric industrial tractor with 20,000 lb rolling capacity and 700 lb drawbar pull. It is designed for saving manhours on numerous towing operations, and is also suited to jobs requiring a pusher. All movement is fingertip-controlled, and power is automatically shut off when the brakes are applied. Front wheel drive permits constant maneuverability in close quarters. *Barrett-Cravens Co.*

For more data insert No. 19 on postcard, p. 37.

Turn to Page 134

BANK ON MONARCH-

Cash in these Vital Production Savings

Production—production—more production—that's the pressure today. More and more output is needed, from every machine, operator, kilowatt and square foot. Are you getting work output that *can't be exceeded* by any new production methods—such as those offered by the most advanced types of modern Monarch Lathes? Before you say "Yes", study the Monarch plus values below. Figure how these savings might be translated into improved output for you. Then, let's get down to cases—and let a Monarch sales engineer furnish actual studies on the jobs you've got right now.

★ ★ ★ ★ ★

SAVE VITAL MATERIALS. Scrap losses, especially with unskilled manpower, can be high. Great reductions in spoilage occur when Monarch's duplicating methods replace the human factor in repetitive turning.

SAVE ON SUBSEQUENT OPERATIONS. With less stock left to remove, grinding time is often reduced by as much as 50%.

CONSERVE SCARCE SKILLED MANPOWER. Even green personnel can operate Tracer-Controlled Monarch Lathes, once the job has been set up.

MULTIPLY OPERATOR'S OUTPUT. Case histories show many instances where one Tracer-Controlled Monarch Lathe has replaced three or even four conventional machines. The fact that he can readily run two machines, on many classes of work, doubles the operator's output.

SAVE ON TOOLS. Save time and money on costly form tools—save on tool-sharpening and tool change time with the Monarch Tracer-Controlled single tool metal turning principle. Insert-type tools save even more! Let us show actual figures.

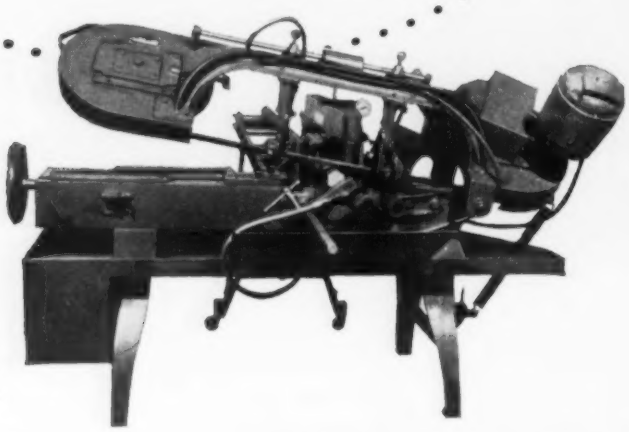
★ ★ ★ ★ ★

Want to cash in on these Monarch savings? We make a complete line of Production, Toolmakers' and Engine Lathes and *three* kinds of Tracer Controls applicable to most of them—the Monarch-Keller, Air-Gage Tracer and Motor Trace Controls. We'll gladly furnish complete information and data. Just ask us for Booklets, indicating your interests . . . *The Monarch Machine Tool Co., Sidney, Ohio.*

Monarch
ACCURACY • ECONOMY • LONG LIFE
TURNING MACHINES

FOR A GOOD TURN FASTER . . . TURN TO MONARCH

Get the advantages of AUTOMATIC BAR STOCK CUT-OFF at a fraction of the cost you might expect



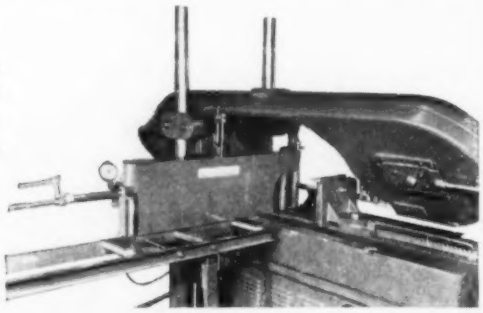
. . . . . with a WELLS SAW and WELLS-O-BAR Feed Master

A set-up for automatic repetitive cutting need not be prohibitively expensive. By combining a Wells Metal Cutting Band Saw and a Wells-O-Bar Feed Master you can automatically cut any quantity of identical lengths of bar stock with a modest investment. Or, a Wells-O-Bar Feed Master can be added to your present horizontal band saw to convert it to an automatic cut-off machine.

For operation the feed unit requires only air at 60 to 80 pounds pressure. Standard feed will project up to 17". The feed mechanism does not interfere with the use of the saw for making single cuts.

See your Wells Dealer for complete information or write direct.

The illustration above shows the Wells-O-Bar unit attached to a Wells No. 8 Saw. At the right is the unit attached to a Wells No. 12 Heavy Duty Machine.



Wells Saws

Wells

Products by Wells are Practical

METAL CUTTING BAND SAWS

WELLS MANUFACTURING CORPORATION
202 WASHINGTON AVE., THREE RIVERS, MICH

new equipment

Continued from Page 130

Abrasive wheel dresser

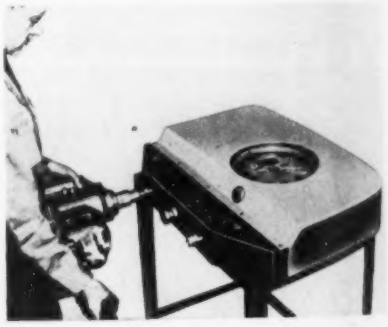
The insert of an abrasive wheel dresser is Norbide, Norton Co.'s molded boron carbide; measures ¼ in. square x ½ in. long; and is set in a convenient aluminum handle 5 in. long. The dresser is designed specifically for the free hand dressing of grinding wheels 10 in. in diam or less and M grade of hardness or softer. *Robert Marks Co.*

For more data insert No. 20 on postcard, p. 37.

Vertical sump pumps

Modern features of design and construction are engineered in a new line of vertical sump pumps. Four basic units are made in a range of sizes from 1 to 10-in. discharge with capacities from 10 to 3000 gpm and heads-up to 140 ft. Pumps are regularly equipped with standard fluid ends but can be furnished with fluid ends for handling sewage in the 2, 3 and 4-in. discharge sizes. Pumps have electric motors from ½ to 75 hp or are supplied for steam turbine drive. *Deming Co.*

For more data insert No. 21 on postcard, p. 37.



Torque analyzer

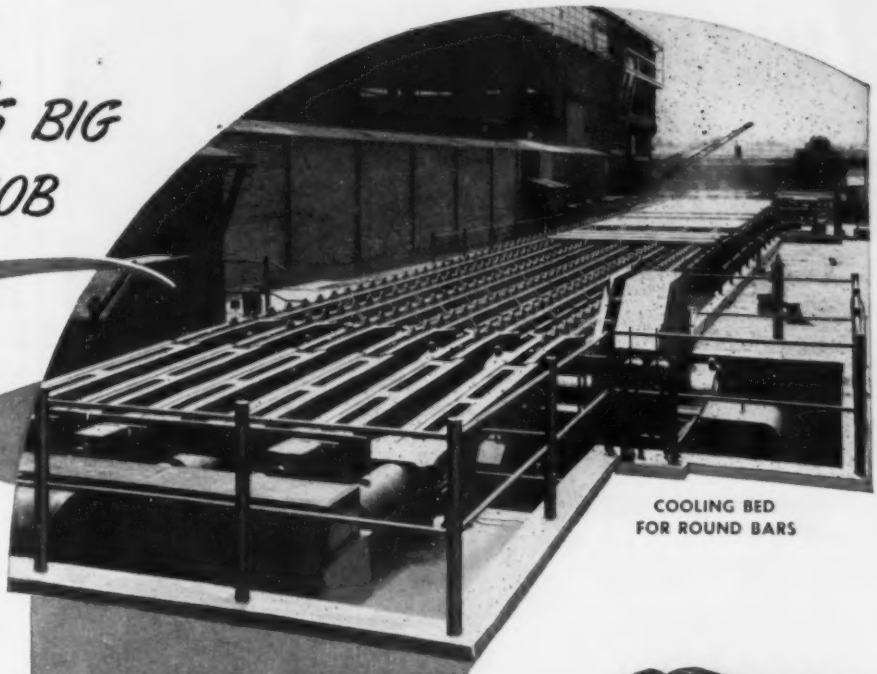
Torque power from 5 to 500 ft-lb can be measured on a new analyzer that features an extra heavy duty precision mechanism adaptable to measuring the torque power of powered nut runners, whether clutch drive, direct drive or impact. It also measures the tension produced by nut and bolt assemblies with a range from 100 to 50,000 lb. All bare metal parts are rust-proofed. The entire operation is mechanical and no power attachments are necessary. *Richmont, Inc.*

For more data insert No. 22 on postcard, p. 37.

Turn to Page 138

F&M makes "what it takes"

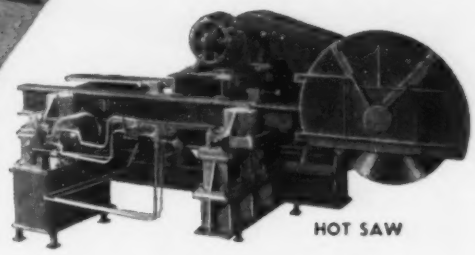
FOR INDUSTRY'S BIG PRODUCTION JOB



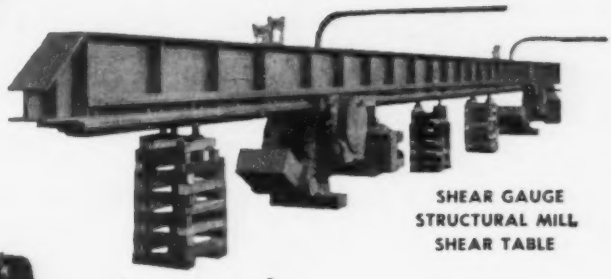
COOLING BED FOR ROUND BARS

F&M Products

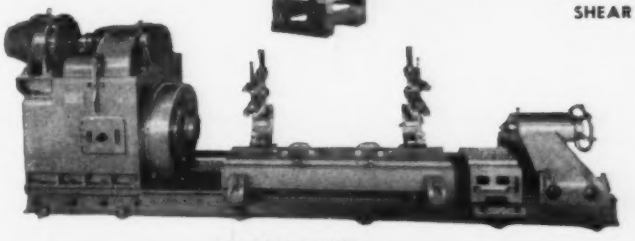
- PARALLOY ROLLS (PINCH, COILER, TENSION, STEEL MILL)
- HYDRAULIC SLAB AND BILLET PILERS
- STRIP AND SHEET OILING EQUIPMENT
- SHEET SCRUBBER AND CLEANING LINES
- HOT SAWS—ROCKING AND SLIDE TYPES
- HOT BEDS—COOLING BEDS—TRANSFERS
- BILLET EJECTORS—PINCH ROLL STANDS
- SLITTERS—SPECIAL SHEARS AND GAUGES
- TILTING TABLES—TRAVELING AND LIFTING TABLES
- CONTINUOUS PICKLING LINES—ROLLER LEVELLERS
- FURNACE CHARGING EQUIPMENT—FURNACE PUSHERS
- STRIP STEEL COILERS AND REELS—SCRAP BALLERS
- RAILROAD SPIKE FORMING MACHINES—ROLL LATHES
- SHEET GALVANIZING LINES—WIRE PATENTING FRAMES
- STRETCHER LEVELLERS—ANGLE AND SHAPE STRAIGHTENERS
- ROLLING MILL TABLES—GEAR AND INDIVIDUAL MOTOR TYPES
- DUCTILE CASTINGS (80,000 PSI)
- MACHINERY BUILT TO CUSTOMER'S DESIGN AND DETAIL DRAWINGS



HOT SAW



SHEAR GAUGE STRUCTURAL MILL SHEAR TABLE



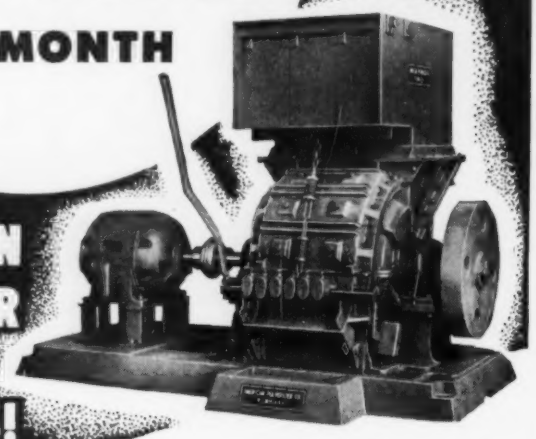
42" ROLL LATHE

The Youngstown Foundry & Machine Co.

OVER SIXTY YEARS OF SERVICE TO THE STEEL INDUSTRY

Youngstown, Ohio

IF
YOUR
METAL TURNINGS
AMOUNT TO
20 TONS OR MORE
PER MONTH



AN AMERICAN
METAL TURNINGS CRUSHER
can bring you
NEW PROFITS!

AMERICAN #2400
METAL TURNINGS CRUSHER

A chip salvage system, with an American Metal Turnings Crusher at the core, can help you realize new savings and profits in metal, oil, man-hours, factory space, and tool maintenance. Consider these typical money-saving, money-making advantages of an American installation:

(1) **Brings $3 to $4 more per ton for chips** than for long machine shop turnings,

(2) **Reclaims 30 to 50 gallons of cutting oil per ton,**

(3) **Prolongs tool life** through more liberal use of recovered oil,

(4) **Saves 75% storage space** . . . permits heavier freight car loads . . . cuts shipping costs,

(5) **Easier, faster handling,**

(6) **Easier briquetting,** so essential for foundry and steel mill use.

THIS COULD BE YOUR PROFIT STORY FOR NEXT YEAR!

240 Tons Metal Turnings Per Year .....$ 960.00 Per Year
(20 tons per month at $4 extra per ton)

3600 Gallons Cutting Oil Recovery at 30¢ Per Gallon . . .$1,080.00 Per Year
(30 gallons per ton x 240 tons = 7200 gallons.
Half of this, 3600 gallons, can be credited to use of chips instead of long turnings.)

Estimated Savings on Manpower, Storage, Tool Maintenance, Freight, etc. .....$ 300.00 Per Year

TOTAL GROSS PROFIT
(Resulting from an American Installation).....$2,340.00 Per Year

WRITE for American Rolling Ring Metal Turnings Crusher Bulletin.

American PULVERIZER COMPANY
Originators and Manufacturers of Ring Crushers and Pulverizers
1539 MACKLIND AVE.
ST. LOUIS 10, MO.

new equipment

Continued from Page 134

Plastic welding lens

A new plastic cover lens for welding helmets and welding goggles is known as Spatterproof and is available in 2x4½ in. and 50 mm round sizes, 0.040 in. thick. The lens is made of a long-service resistant plastic that is said to withstand pitting for longer periods than glass. *Willson Products, Inc.*

For more data insert No. 23 on postcard, p. 37.

Electroplating rectifier

Designed for the electroplating and electrochemical industries, a new selenium rectifier has a full wave rectifier circuit with voltage continuously variable from 0 to 8 v dc at 150 amp capacity, or 0 to 16 v dc at 75 amp capacity. Convenient voltage change terminals and dc output terminals are mounted on the rectifier front panel. An accurately calibrated fully magnetic circuit braker gives full protection at all voltage settings. Meters are rectangular panel type with D-Arsonval movements. *Electronic Rectifier Co., Inc.*

For more data insert No. 24 on postcard, p. 37.

Gasoline fork trucks

Yale gasoline fork trucks are now available in spark-enclosed models to provide the maximum possible safety operation in gas and dust laden areas, and are designated as Underwriter's Laboratories type GS. Protection has been accomplished by shielding the electrical equipment against sparking, by providing a water type exhaust manifold and a water cooled muffler, and by using static conductive tires. *Yale & Towne Mfg. Co.*

For more data insert No. 25 on postcard, p. 37.

Miniature screwdriver

Less than an inch in diameter and weighing 8 oz, Desoutter's new high-speed screwdriver and nutrunner handles screws from No. 1 to No. 8 ANF and ANC and equivalent nuts. Reversing control is built into the head of the tool, makes it suitable for dis-assembly work. *Newage International, Inc.*

For more data insert No. 26 on postcard, p. 37.

Turn to Page 142

One way to lick shortages of both men and machines

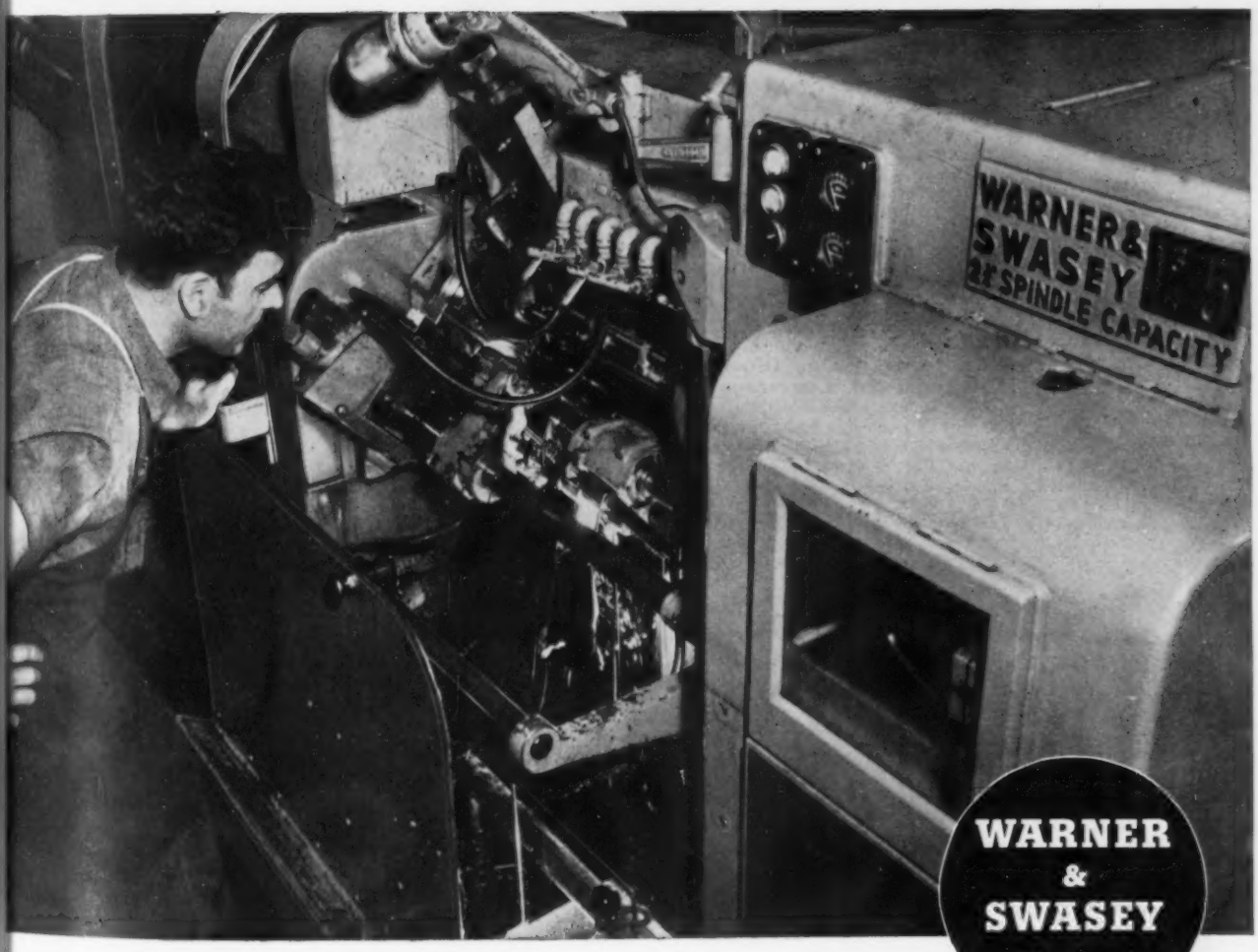
● If yours is like many companies, you need to buy new machine tools and hire new men—both scarce—to meet today's huge production demands.

The new Warner & Swasey automatics are designed to help you solve both of these problems.

These automatics—either single or 5-spindle machines—are ideally suited for certain types of work, even in small or medium lot runs. In your plant, one or two automatics very possibly can take the place of as many as five hand-operated machines. Savings in investment and floor space are obvious.

And one man can generally operate two or more automatics. This fact, coupled with the greater capacity of each automatic—from two to five times that of a hand-operated machine—can step up his productivity tremendously.

So when you need new machine tools, don't simply reorder on the basis of previous experience. Talk it over with your Warner & Swasey Field Engineer. He may again recommend turret lathes, but perhaps he'll show you how you can do your particular job better and more profitably with automatics.



WARNER & SWASEY
Cleveland

YOU CAN MACHINE IT BETTER, FASTER, FOR LESS WITH WARNER & SWASEY TURRET LATHES, AUTOMATICS AND TAPPING MACHINES

Designed to handle loads of 500, 1000, or 2000 lbs., the Shepard Niles Lift-About Jr. electric hoist actually exceeds, in performance, that which customarily is expected from these lighter service hoists. And requires less maintenance in doing so.

Two factors are responsible for such outstanding performance: one is a sound engineering background that comes from years of specialized experience. This is apparent in the design and construction of the hoist itself. The other is the Shepard Niles policy of making certain that the hoist you buy is the *right* hoist for *your* service. It is a policy that protects against buying a hoist that is too light for severe service. By the same token, it prevents investing more than necessary when lighter service *is* indicated.

If you would like help with your handling problems, write us. A Shepard Niles specialist will be glad to place our years' of material handling experience at your service.

Shepard Niles

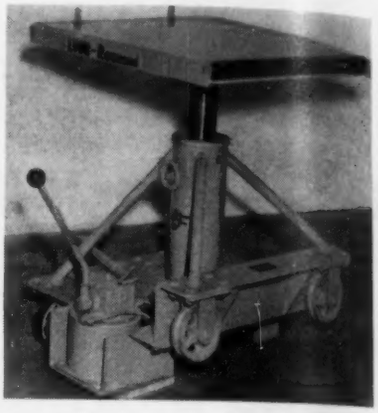
CRANE & HOIST CORPORATION

Makes and sells all three lifting tools for airborne shop loads

356 SCHUYLER AVENUE • MONTOUR FALLS, N. Y.

new equipment

Continued from Page 138



Elevating table

A special hydraulic elevating table with a capacity of 2000 lb has a 16-in. range of elevation permitting molds to be placed in presses at different levels. The top lowers to 28 in. and raises to 44 in. Heavy molds roll over a single roller mounted on the front edge of the top, that will turn 360° or can be locked in one fixed position. Elevation is actuated by a two-speed hand pump. The table has two offset grooved wheels to run on angle iron tracks. *Lyon-Raymond Corp.*

For more data insert No. 27 on postcard, p. 37.

Precision tumbling machine

Large quantities of parts are precision finished at one time in a new automatic control precision tumbling machine. New features make its operation more automatic and enable the operator to work in greater safety. It is pushbutton operated, and has jogging provisions and a magnetic reversing starter with 110 v control transformer. Once the machine is started, automatic timer will stop its operation any time from 0 to 20 hr without further attention. A 5 hp variable speed power unit with a remote control handle provides adjustment of the cylinder speed from 10 to 30 rpm. Each of its two compartments has a capacity of 18 cu ft. It is built of 3/16 in. steel. *Roto-Finish Co.*

For more data insert No. 28 on postcard, p. 37.

Resume Your Reading on Page 41

High Strength for the reduction of HARD-TO-ROLL STEELS

• BIRDSBORO "30" is the name to remember for the tough job of reducing high-percentage type alloy steels. It is the strongest and toughest of the alloy steel rolls for blooming, cogging and roughing Aircraft Quality, Stainless and High Speed Steel.

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for Corrosion Resistance and Paint Systems on Non-Ferrous Metals; ARP Plating Chemicals

publications

Continued from Page 37

Centerless grinding

Principles of Centerless Grinding graphically describes a widely used process. This third printing of a popular 48-p. booklet contains many pictures and drawings illustrating machines, methods and work setups. *The Cincinnati Milling Machine Co.*

For free copy insert No. 34 on postcard, p. 37.

Hollow mills

Development of a special hollow mill and centering tool of high speed steel to mill required tolerances in one operation is described in a new leaflet. Specifications and methods for producing this and other special tools are described. The tools are designed to give longer runs with fewer grinding operations. *Woodruff & Stokes Co.*

For free copy insert No. 35 on postcard, p. 37.

Emulsion cleaner

Pelron emulsion cleaner No. 205 is described in a recent technical bulletin. The cleaner embodies a new principle of detergency which causes the soil to be only partially emulsified in the cleaning solution. It then floats out of the cleaning solution rather than remain in the machine to redeposit on the work. *Pelron Corp.*

For free copy insert No. 36 on postcard, p. 37.

High speed steel

High speed steels produced in high frequency electric furnaces are described in a 22-p. booklet. Data on tools made from these steels, with performance and specifications, are discussed. *Edgar Allen & Co., Ltd.*

For free copy insert No. 37 on postcard, p. 37.

Carbide tooling

Cemented carbide tools and their applications are the subject of a new 74-p. catalog. Much valuable data on application of these cost-cutting tools are included. Machining information will make this catalog of considerable value to the shop superintendent. *Kenametal, Inc.*

For free copy insert No. 38 on postcard, p. 37.

Resume Your Reading on Page 38

IRON AGE *markets and prices*

market briefs and bulletins

can't get alloy — Inability of locomotive builders to get alloy steels is delaying their building program, the industry's advisory committee told NPA. In fact the committee said such shortages had already caused shutdowns by some diesel plants. Some builders said it was difficult if not impossible to get boron-treated substitutes for some alloy uses.

low scrap exports—Reporting a lowered rate of exports of scrap iron and steel the Federation of W. German Iron & Steel Managers stated that a total of 41,000 tons had been exported out of a production of 230,000 tons. At the same time production of rolled steel products rose to 807,177 tons in June as compared with May's production of 744,045 tons.

prices up — Tennessee Coal, Iron & Railroad Co., yesterday announced an increase of from ¼¢ to 1¢ per lb in prices of certain products containing more than 5 pct nickel. This reflected the increase of 6¢ per lb in the price of nickel approved by the Canadian government last month.

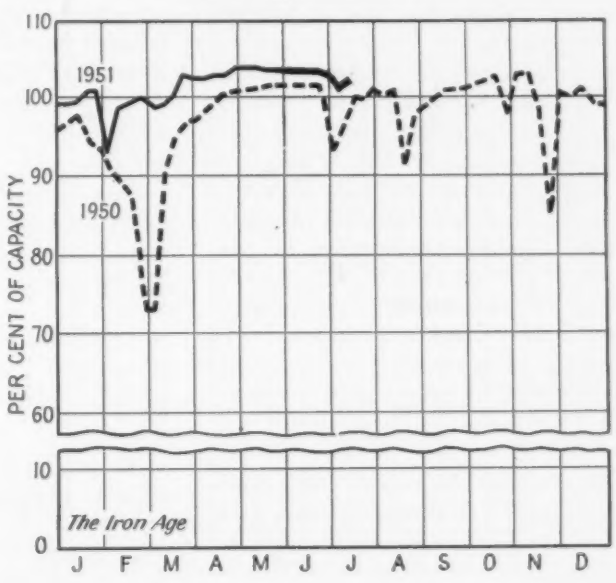
foundry equipment up — The Foundry Equipment Manufacturers Association, in Cleveland, has announced that the total dollar value of shipments in May was $3,180,894 or a rise of $236,871 over April. In a breakdown of figures, FEMA reports an increase of $52,151 for repairs and $184,720 for new equipment.

rise in layoffs—According to statistics issued by the U. S. Dept. of Labor, cutbacks in automobile production and allied components were responsible for the rise in layoffs reported during May.

to vote on merger — Stockholders of Dunn Steel Products Co., Plymouth, Mich., will vote on July 25 on a proposal to merge with Townsend Co., New Brighton, Pa. Townsend shareholders will vote on the same question on July 27. If the merger is approved, Townsend will operate Dunn as a division, which will continue to manufacture cold headed parts primarily for the automobile industry.

turn to defense—Two new factories being built in Chicago by Hotpoint, Inc., appliance manufacturer, will be devoted entirely to production of jet engine components. Production is expected to begin in late fall with scheduled output reached in the spring of 1952.

Steel Operations †



District Operating Rates—Per Cent of Capacity †

Week of	Pittsburgh	Chicago	Youngstown	Philadelphia	West	Buffalo	Cleveland	Detroit	Wheeling	South	Ohio River	St. Louis	East	Aggregate
July 1	101.0	106.0	95.0	99.5	103.0	104.0	96.0	85.0	97.0	99.0	87.0	95.0	84.0	101.0
July 8	97.0	106.0	101.0	101.0	104.0	104.0	95.0	103.0	101.0	99.0	94.0	90.0	40.0	101.5

† Beginning Jan. 1, 1951, operations are based on annual capacity of 104,229,650 net tons.

nonferrous metals

outlook and market activities

NONFERROUS METAL PRICES

	July 4	July 5	July 6	July 7	July 9	July 10
Copper, electro, Conn.	....	24.50	24.50	24.50	24.50	24.50
Copper, Lake delivered	....	24.625	24.625	24.625	24.625	24.625
Tin, Straits, New York	....	$1.06	$1.06	....	$1.06	$1.06*
Zinc, East St. Louis	....	17.50	17.50	17.50	17.50	17.50
Lead, St. Louis	....	16.80	16.80	16.80	16.80	16.80

*Tentative.

Note: Quotations are going prices.

by R.Hatschek

Rollbacks Show Effect—Recent price rollbacks are being felt in scrap metal circles by a reduction in shipments of aluminum. Some dealers say that the amount of aluminum that is coming out is very poor and they attribute this fact to the terrific cut in incentive for the collectors. It is expected in some quarters that this situation will last as long as price controls. Others feel that it is more temporary.

The same effect shows in red metal as well but not as severely. Dealers had all emptied their yards in anticipation of the rollbacks and some are now trying to build up stocks in anticipation of the possible termination of controls at the end of this month. Very little business is taking place at present and the situation will probably continue until the trade sees what Congress is going to do.

Total Zinc Allocation—National Production Authority has modified order M-9 so that zinc now will be 100 pct allocated. The order takes effect on Aug. 1 and every user of zinc must have NPA blessing to get the metal except for stockpile deliveries, zinc from foreign sources if it is to be resold without any change and some small consumers. What the order actually does is to put zinc into a sort of Controlled Materials Plan without using that term.

Shuffle Other Orders—M-12 has also been revised. It no longer covers copper and copper base alloys but now applies mainly to brass and copper wire mills and foundries with chemicals and plating included along with others not now covered by other orders or CMP. M-47A now covers copper in civilian goods; M-4 controls brass mill product use in construction and; use of copper and alloyed products in building is included in M-74, a new one. MRO provisions are to be switched to CMP-5 and inventory controls to CMP-2.

For July, brass and copper wire mill production is limited to 80 pct of average output for the first half of 1950 while foundry production is allowed at 100 pct levels. All of these controls apply during July only and the revised M-16 goes into effect on Aug. 1.

Tungsten Allocation—Tungsten and molybdenum are to be allocated among the nations of the free world. That was the decision of an 11-nation conference on vital raw materials. Maximum and minimum prices of $65 and $55 per short ton unit were set on tungsten ore for stop-gap action.

The United States is to get the lion's share of these two metals with 44.8 pct of the tungsten and 77.8 pct of the molybdenum. Remaining tungsten allocations are: Britain, 24.9 pct; Germany, 10.3 pct; France, 10 pct; Sweden, 7.5 pct; and Australia, Canada, Spain and Yugoslavia will share the remaining 2.5 pct. Other molybdenum shares are: Britain, 11.7 pct; France, 4.4 pct; Germany, 2.8 pct; Sweden, 2.3 pct; and un-named other countries will split the remaining 1 pct.

RFC Tin Price Holds—Reconstruction Finance Corp. has maintained the $1.06 per lb price since June 18 as anticipated. At the end of last week the Far Eastern price had dropped to a New York equivalent of $1.07¼ and it is still expected at press time that the RFC price will hold for a few more days despite any antics in Singapore. (See THE IRON AGE, July 5, 1951, p. 150.)

Copper Price Question—What practically amounts to official recognition of the current copper price mess came in the form of a statement to the Senate Finance Committee by price stabilizer Eric Johnston. He is reported to have said flatly that the current situation is unsatisfactory and that the government will either have to grant a 3¢ subsidy to the Chileans or boost the domestic ceiling to 27.5¢ per lb. He also said that he is under pressure for an even higher price on foreign copper.

MILL PRODUCTS

(Cents per lb, unless otherwise noted)

Aluminum

(Base 30,000 lb, f.o.b. ship. pt. frt. allowed)

Flat Steel: 0.188 in., 2S, 3S, 30.1¢; 4S, 61S-O, 32¢; 52S, 34.1¢; 24S-O, 24S-OAL, 32.9¢; 75S-O, 75S-OAL, 39.9¢; 0.081 in., 2S, 3S, 31.2¢; 4S, 61S-O, 33.5¢; 52S, 35.6¢; 24S-O, 24S-OAL, 34.1¢; 75S-O, 75S-OAL, 41.8¢; 0.032 in., 2S, 3S, 32.9¢; 4S, 61S-O, 37.1¢; 52S, 39.8¢; 24S-O, 24S-OAL, 41.7¢; 75S-O, 75S-OAL, 52.2¢.

Plate ¼ in. and heavier: 2S, 3S-F, 28.3¢; 4S-F, 30.2¢; 52S-F, 31.8¢; 61S-O, 30.8¢; 24S-O, 24S-OAL, 32.4¢; 75S-O, 75S-OAL, 38.8¢.

Extruded Solid Shapes: Shape factors 1 to 5, 26.2¢ to 74.5¢; 12 to 14, 36.9¢ to 89¢; 24 to 26, 39.6¢ to $1.16; 36 to 38, 47.2¢ to $1.70.

Rod, Rolled: 1.5 to 4.5 in., 2S-F, 3S-F, 27.5¢ to 33.5¢; cold finished, 0.375 to 3 in., 2S-F, 3S-F, 40.5¢ to 55¢.

Screw Machine Stock: Rounds, 11S-T3, ⅛ to 11/32 in., 53.5¢ to 42¢; ⅜ to 1½ in., 41.5¢ to 39¢; 1 9/16 to 3 in., 38.5¢ to 36¢; 17S-T4 lower by 1.5¢ per lb. Base 5000 lb.

Drawn Wire: Coiled, 0.051 to 0.374 in., 2S, 29.5¢ to 29¢; 52S, 48¢ to 35¢; 56S, 51¢ to 42¢; 17S-T4, 54¢ to 37.5¢; 61S-T4, 48.5¢ to 37¢; 75S-T6, 84¢ to 67.5¢.

Extruded Tubing, Rounds: 63-S-T-5, OD in in.: 1¼ to 2, 37¢ to 54¢; 2 to 4, 33.5¢ to 45.5¢; 4 to 6, 34¢ to 41.5¢; 6 to 9, 34.5¢ to 43.5¢.

Roofing Sheet, Flat: 0.019 in. x 28 in. per sheet, 72 in., $1.142; 96 in., $1.522; 120 in., $1.902; 144 in., $2.284. Gage 0.024 in. x 28 in., 72 in., $1.379; 96 in., $1.839; 120 in., $2.299; 144 in., $2.759. Coiled Sheet: 0.019 in. x 28 in., 28.2¢ per lb.; 0.024 in. x 28 in. 26.9¢ lb.

Magnesium

(F.O.B. mill, freight allowed)

Sheet and Plate: FS1-O, ¼ in. 63¢; 3/16 in. 65¢; ⅛ in. 67¢; B & S Gage 10, 68¢; 12, 72¢; 14, 78¢; 16, 85¢; 18, 93¢; 20, $1.05; 22, $1.27; 24, $1.67. Specification grade higher. Base: 30,000 lbs.

Extruded Round Rod: M, diam in., ¼ to 0.311 in., 74¢; ½ to ¾ in., 57.5¢; 1¼ to 1.749 in., 53¢; 2½ to 5 in., 48.5¢. Other alloys higher. Base Up to ¾ in. diam, 10,000 lb; ⅞ to 2 in., 20,000 lb; 2 in. and larger, 30,000 lb.

Extruded Solid Shapes, Rectangles: M. In weight per ft, for perimeters less than size indicated, 0.10 to 0.11 lb, 2.5 in., 62.3¢; 0.22 to 0.25 lb, 5.9 in., 59.3¢; 0.50 to 0.59 lb, 8.6 in., 56.7¢; 1.8 to 2.59 lb, 19.5 in., 53.8¢; 4 to 6 lb, 28 in., 49¢. Other alloys higher. Base, in weight per ft of shape: Up to ½ lb, 10,000 lb. ½ to 1.80 lb, 20,000 lb; 1.80 lb and heavier, 30,000 lb.

Extruded Round Tubing: M, wall thickness, outside diam, in., 0.049 to 0.057, ¼ in. to 5/16, $1.40; 5/16 to ⅜, $1.26; ½ to ⅝, 93¢; 1 to 2 in., 76¢; 0.165 to 0.219, ⅝ to ⅞, 61¢; 1 to 2 in., 57¢; 3 to 4 in., 56¢. Other alloys higher. Base, OD in in.: Up to 1½ in., 10,000 lb; 1¼ in. to 8 in., 20,000 lb; 8 in. and larger, 30,000 lb.

Titanium

(10,000 lb base, f.o.b. mill)

Commercially pure and alloy grades: Sheet and strip, HR or CR, $15; Plate, HR, $12; Wire, rolled and/or drawn, $10; Bar, HR or forged, $6; Forgings, $6.

Nickel and Monel

(Base prices, f.o.b. mill)

	"A" Nickel	Monel
Sheets, cold rolled	77	60½
Strip, co'd-rolled	83	63½
Rods and bars	73	58½
Angles, hot-rolled	73	58½
Plates	75	59½
Seamless tubes	106	93½
Shot and blocks	..	53½

Copper, Brass, Bronze

(Freight prepaid on 200 lb)

	Sheet	Rods	Extruded Shapes
Copper	40.18	....	39.78
Copper, h-r	....	36.03	....
Copper, drawn	....	37.28	....
Low brass	38.47	38.16	....
Yellow brass	37.28	36.97	....
Red brass	38.86	38.55	....
Naval brass	42.27	36.33	37.59
Leaded brass	....	....	35.86
Com'l bronze	40.18	39.87	....
Mang. bronze	45.77	39.80	41.36
Phos. bronze	59.42	59.67	....
Muntz metal	40.28	35.84	37.09
Ni silver, 10 pct	48.26	50.59	....

PRIMARY METALS

(Cents per lb, unless otherwise noted)

Aluminum ingot, 99+%, 10,000 lb, freight allowed	19.00
Aluminum pig	18.00
Antimony, American, Laredo, Tex.	42.00
Beryllium copper, 3.75-4.25% Be	$1.56
Beryllium aluminum 5% Be, Dollars per lb contained Be	$69.00
Bismuth, ton lots	$2.25
Cadmium, del'd	$2.55
Cobalt, 97-99% (per lb)	$2.10 to $2.17
Copper, electro, Conn. Valley	24.50
Copper, Lake, delivered	24.625
Gold, U. S. Treas., dollars per oz.	$35.00
Indium, 99.8%, dollars per troy oz.	$2.25
Iridium, dollars per troy oz.	$200
Lead, St. Louis	16.80
Lead, New York	17.00
Magnesium, 99.8+%, f.o.b. Freeport, Tex., 10,000 lb	24.50
Magnesium, sticks, 100 to 500 lb	42.00 to 44.00
Mercury, dollars per 76-lb flask, f.o.b. New York	$210-$213
Nickel electro, f.o.b. N.Y. warehouse	59.58
Nickel oxide sinter, at Copper Cliff, Ont., contained nickel	52.75
Palladium, dollars per troy oz.	$24.00
Platinum, dollars per troy oz.	$90 to $93
Silver, New York, cents per oz.	90.16
Tin, New York	$1.06
Titanium, sponge	$5.00
Zinc, East St Louis	17.50
Zinc, New York	18.25
Zirconium copper, 50 pct	$6.20

REMELTED METALS

Brass Ingot

(Cents per lb, delivered carloads)

85-5-5-5 ingot	
No. 115	29.00
No. 120	28.50
No. 123	28.00
80-10-10 ingot	
No. 305	35.00
No. 315	32.00
88-10-2 ingot	
No. 210	47.50
No. 215	44.50
No. 245	37.00
Yellow ingot	
No. 405	25.50
Manganese bronze	
No. 421	32.75

Aluminum Ingot

(Cents per lb, 10,000 lb. and over)

95-5 aluminum-silicon alloys	
0.30 copper, max.	20.6
0.60 copper, max.	20.4
Piston alloys (No. 122 type)	21.2
No. 12 alum. (No. 2 grade)	19.5
108 alloy	20.6
195 alloy	20.8
13 alloy	20.8
ASX-679	20.5

Steel deoxidizing aluminum, notch-bar granulated or shot

Grade 1—95-97½%	18.00
Grade 2—92-95%	17.75
Grade 3—90-92%	17.25
Grade 4—85-90%	16.50

ELECTROPLATING SUPPLIES

Anodes

(Cents per lb, freight allowed, 500 lb lots)

Copper	
Cast, oval, 15 in. or longer	39½
Electrodeposited	33⅜
Rolled, oval, straight, delivered	38⅞
Forged ball anodes	43
Brass, 80-20	
Cast, oval, 15 in. or longer	34¾
Zinc, oval	26½
Ball anodes	25½
Nickel 99 pct plus	
Cast	76.00
Rolled, depolarized	77.00
Cadmium	$2.80
Silver 999 fine, rolled, 100 oz lots, per troy oz, f.o.b. Bridgeport, Conn.	97½

Chemicals

(Cents per lb, f.o.b. shipping points)

Copper cyanide, 100 lb drum	63
Copper sulfate, 99.5 crystals, bbl	12.85
Nickel salts, single or double, 4-100 lb bags, frt. allowed	20½
Nickel chloride, 375 lb drum	27½
Silver cyanide, 100-oz lots, per oz	67¼
Sodium cyanide, 96 pct domestic 200 lb drums	19.25
Zinc cyanide, 100 lb drum	47.7

SCRAP METALS

Brass Mill Scrap

(Cents per pound, add ½¢ per lb for shipments of 20,000 to 40,000 lb; add 1¢ for more than 40,000 lb)

	Heavy	Turnings
Copper	21½	20¾
Yellow Brass	19⅛	17⅞
Red brass	20⅛	19⅞
Comm. bronze	20½	19¾
Mang. bronze	18¾	18
Brass rod ends	18⅞	....

Custom Smelters' Scrap

(Cents per pound, carload lots, delivered to refinery)

No. 1 copper wire	19.25
No. 2 copper wire	17.75
Light copper	16.50
Refinery brass	17.25*
Radiators	16.50

*Dry copper content.

Ingot Makers' Scrap

(Cents per pound, carload lots, delivered to refinery)

No. 1 copper wire	19.25
No. 2 copper wire	17.75
Light copper	16.50
No. 1 composition	19.50
No. 1 comp. turnings	19.25
Rolled brass	15.50
Brass pipe	16.50
Radiators	15.50
Aluminum	
Mixed old cast	9.75
Mixed new clips	11.00
Mixed turnings, dry	9.50
Pots and pans	9.25

Dealers' Scrap

(Dealers' buying prices, f.o.b. New York in cents per pound)

Copper and Brass

No. 1 heavy copper and wire	18¾—19¼
No. 2 heavy copper and wire	17¼—17¾
Light copper	16 —16½
New type shell cuttings	16 —16½
Auto radiators (unsweated)	15 —15½
No. 1 composition	19 —19½
No. 1 composition turnings	18¾—19¼
Unlined red car boxes	18¾—19¼
Cocks and faucets	16¼—16¾
Mixed heavy yellow brass	13½—14
Old rolled brass	15 —15½
Brass pipe	16 —16½
New soft brass clippings	16 —16½
Brass rod ends	17½—18
No. 1 brass rod turnings	17 —17½

Aluminum

Alum. pistons and struts	7½— 8
Aluminum crankcases	7½— 8
2S aluminum clippings	9 — 10½
Old sheet and utensils	7½— 8
Borings and turnings	5
Misc. cast aluminum	7½— 8
Dural clips (24S)	10 —11

Zinc

New zinc clippings	12¼—12½
Old zinc	9 — 9¼
Zinc routings	5¾— 6
Old die cast scrap	5¾— 6

Nickel and Monel

Pure nickel clippings	35 —36
Clean nickel turnings	35 —36
Nickel anodes	35 —36
Nickel rod ends	35 —36
New Monel clippings	28 —29
Clean Monel turnings	20 —21
Old sheet Monel	28 —29
Nickel silver clippings, mixed	13 —14
Nickel silver turnings, mixed	12 —13

Lead

Soft scrap, lead	14 —14½
Battery plates (dry)	9½—10

Magnesium

Segregated solids	15 —16
Castings	14 —15

Miscellaneous

Block tin	85 —90
No. 1 pewter	60 —65
No. 1 auto babbitt	48 —50
Mixed common babbitt	16 —17
Solder joints	21 —22
Siphon tops	48 —50
Small foundry type	20½—21
Monotype	18¼—18½
Lino. and stereotype	17½—18
Electrotype	15¾—16
Hand picked type shells	8¾— 9
Lino. and stereo. dross	8¾— 9
Electro. dross	5¼

SCRAP *iron and steel*

markets prices trends

Peace talks have no effect on scrap . . . Activity will stay high even if steel rate drops . . . Vacations cut cast demand.

The Fourth of July holiday slowed down all scrap markets last week and things were generally quieter. Foundry vacation periods have caused a lessening of demand for cast grades but demand for heavy melting grades continues at a high pitch.

There is a further slackening of scrap output by industrial sources for two reasons. First, many plants shut down for a 2-week vacation in the beginning of July and, second, National Production Authority cutbacks on civilian goods have knifed into industrial activity, thus lowering scrap generation.

This latter case has hit especially heavily in Detroit auto production and total scrap tonnage on the automotive lists in June has fallen considerably below the levels of the previous month.

Inventories of Pittsburgh scrap consumers are a bit higher this week but interests in that center of activity, as well as all the other major scrap markets, are extremely concerned about scrap supply during this fall and winter when collections will drop off because of the weather. Some trade sources estimate that scrap flow will drop by about 20 pct.

Nowhere has any effect of the Korean peace talks been felt. Most people feel that the defense effort will continue even if the war ends and that will mean an unabated steel demand. Even if the steel production rate should drop, scrap activities will continue at high levels as mills will try to rebuild the inventories they have watched evaporating in the past year.

One other note—the hearing, scheduled for July 24 before the Interstate Commerce Commission, on reduced freight rates for cars loaded with 40 tons or more of scrap has been postponed for 60 days. The Institute of Scrap Iron & Steel is behind the petition.

PITTSBURGH—Scrap consumers are just a little happier about their inventory position. Some have even managed to build up their stocks by several days. However, concern for the coming winter in still general. No one feels that developments in Korea will affect the market. Even if a decline in steel operations—which everyone agrees is unlikely—were to develop, the mills would still be anxious to build inventories to normal levels.

CHICAGO—There has been a noticeable lessening of demand for cast iron scrap probably because some of the foundries have been shutting down for vacations. Demand is still good but the extreme pressure has been taken out of the market. Openhearth scrap, of dealer origin, continues to fall off as dealers are taking advantage of premiums offered for the preparation of foundry grades. Allocations have enabled some mills in the area to increase their inventories of scrap but not in sufficient amounts to ward off shortages expected during the fall and winter months.

PHILADELPHIA—The Fourth of July holiday contributed to a general slowing of the scrap market in this district. Industrial plants shutting down for the 2-week vacation period last week cut further into the flow of industrial scrap and the outlook is a bit glum with most eastern Pennsylvania mills down to 5 to 15 day inventories. Allocations of scrap helped but they didn't seem to help enough. Next winter still has everyone worried.

NEW YORK—Foundry vacation periods which started last week, have contributed to a general easing of the cast iron scrap situation in the market here. No abatement has been felt in the demand for steel scrap and brokers express concern about the future. The Korean peace talks have had no effect whatever on the situation here and no changes are anticipated for the near future whatever their outcome might be.

DETROIT—Two developments during the past week have focused further attention on the growing scrap shortage in this area: (1) Gross scrap tonnage on automobile lists was off substantially in June compared with the previous month, (2) Upstate dealer scrap has been allocated. While the tonnage involved is not large, dealers handling up to 1000 tons or more are on the list of cities which includes Flint, Battle Creek, Jackson, Pontiac and other industrial centers. Most of the scrap to be allocated is No. 2 rather than No. 1

CLEVELAND—The scrap market here and in the Valley was unchanged this week. Demand for all grades except blast furnace is terrific and shipments were off slightly. The plant vacation period is getting under way and is expected to help the scrap inventory position of foundries temporarily. By the same token, plant scrap will be reduced and mills will be affected adversely.

BIRMINGHAM—With more and more southern scrap steel being allocated to northern mills, the pinch on mills in the South is becoming tighter. The largest mill in the district, which has been in rather desperate need of scrap for some time, has asked for allocations. The cast situation is a little easier but foundries are crying for more. Some brokers say cessation of fighting in Korea may help some this fall, but not much, and they predict more allocations.

CINCINNATI—Demand is strong and and supply weak. A number of the foundries are closed for the plant vacation period and demand for cast grades has declined accordingly. Openhearth material is in tight supply and mills are battling for every ton they can get in addition to allocated tonnage.

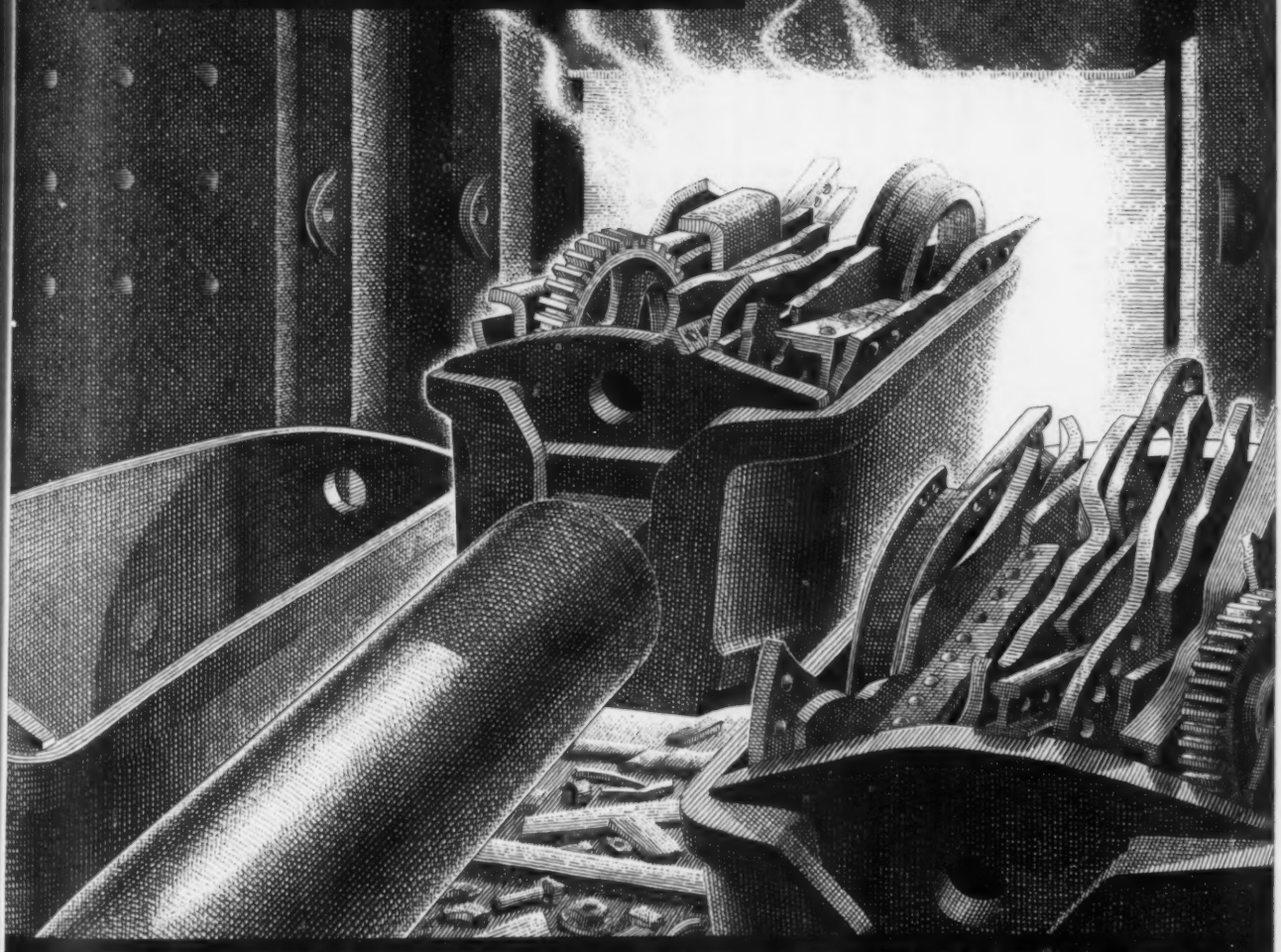
BOSTON—Developments here in the New England Area indicate a slow down in demand, particularly in cast grades. Although there is plenty of activity, it is felt that the released tension in the scrap market here is caused by the summer vacation period.

ST. LOUIS—The movement of scrap iron to the St. Louis industrial district has tapered off as a result of heavy rains and high water in the agricultural producing sections. When the weather becomes more favorable, it will require work on the farms and away from scrap collections. Steel mills' inventories are dwindling as receipts fall below consumption. Foundry grades are easier because of vacations.

BUFFALO—While collections are better, mills report only negligible amounts have been added to reserves so far. Cast scrap continues on the easy side, but sales are not expected at this time below ceiling prices.

SCRAP *at your Service!*

The facilities and experienced personnel in each of our offices, stand ready to supply your every scrap requirement whenever and wherever needed.



LURIA BROTHERS AND COMPANY, INC.

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LEADERS IN IRON AND STEEL SCRAP SINCE 1889

Iron and Steel

SCRAP PRICES

(Maximum basing point prices, per gross ton, as set by OPS, effective Feb. 7, 1951. Shipping point and delivered prices calculated as shown below.)

Switching Charge (Dollars per gross ton) →		$0.99 .75 .53 .65 .75 .51 .75	.75 .61 .51 .75 .70	.75 .83 .65 .25	1.34 .75 .50 .20 .51 .51	.20 .62 .47 .51 .51	.51	.85	.50	.78	.50 .43 .51	.33	.57	.60 .60 .60 .60 .60 .60
Basing Points →		Pittsburgh, Johnstown, Brackenridge, Butler, Midland, Monessen, Sharon	Youngstown, Canton, Steubenville, Warren, Weirton	Cleveland, Buffalo, Cincinnati, Middletown	Chicago, Claymont, Coatesville, Conshohocken, Harrisburg, Phoenixville	Sparrows Pt., Bethlehem, Ashland, Ky., Kokomo, Ind., Portsmouth, O.	St. Louis	Detroit	Duluth	Kansas City	Birmingham, Alabama City, Atlanta	Minnequa	Houston	Los Angeles, Pittsburg, Cal., Portland, Ore., San Francisco, Seattle
GRADES	OPS No.													
No. 1 heavy melting	1	$44.00	$44.00	$43.00	$42.50	$42.00	$41.00	$41.15	$40.00	$39.50	$39.00	$38.00	$37.00	$36.00
No. 2 heavy melting	2	42.00	42.00	41.00	40.50	40.00	39.00	39.15	38.00	37.50	37.00	36.00	35.00	33.00
No. 1 busheling	3	44.00	44.00	43.00	42.50	42.00	41.00	41.15	40.00	39.50	39.00	38.00	37.00	35.00
No. 1 bundles	4	44.00	44.00	43.00	42.50	42.00	41.00	41.15	40.00	39.50	39.00	38.00	37.00	35.00
No. 2 bundles	5	41.00	41.00	40.00	39.50	39.00	38.00	38.15	37.00	36.50	36.00	35.00	34.00	32.00
Machine shop turnings	6	34.00	34.00	33.00	32.50	32.00	31.00	31.15	30.00	29.50	29.00	28.00	27.00	25.00
Mixed borings and turnings	7	38.00	38.00	37.00	36.50	36.00	35.00	35.15	34.00	33.50	33.00	32.00	31.00	29.00
Shovelling turnings	8	38.00	38.00	37.00	36.50	36.00	35.00	35.15	34.00	33.50	33.00	32.00	31.00	29.00
Cast iron borings	10	38.00	38.00	37.00	36.50	36.00	35.00	35.15	34.00	33.50	33.00	32.00	31.00	29.00
No. 1 chemical borings	26	41.00	41.00	40.00	39.50	39.00	38.00	38.15	37.00	36.50	36.00	35.00	34.00	32.00
Forge crops	11	51.50	51.50	50.50	50.00	49.50	48.50	48.65	47.50	47.00	46.50	45.50	44.50	42.00
Bar crops and plate	12	49.00	49.00	48.00	47.50	47.00	46.00	46.15	45.00	44.50	44.00	43.00	42.00	40.00
Punchings and plate	14	46.50	46.50	45.50	45.00	44.50	43.50	43.65	42.50	42.00	41.50	40.50	39.50	37.50
Elect ic furnace bundles	15	46.00	46.00	45.00	44.50	44.00	43.00	43.15	42.00	41.50	41.00	40.00	39.00	37.00
Cut struct., plate, 3 ft and less	16	47.00	47.00	46.00	45.50	45.00	44.00	44.15	43.00	42.50	42.00	41.00	40.00	38.00
Cut struct., plate, 2 ft and less	17	49.00	49.00	48.00	47.50	47.00	46.00	46.15	45.00	44.50	44.00	43.00	42.00	40.00
Cut struct., plate, 1 ft and less	18	50.00	50.00	49.00	48.50	48.00	47.00	47.15	46.00	45.50	45.00	44.00	43.00	41.00
Foundry steel, 2 ft and less	20	46.00	46.00	45.00	44.50	44.00	43.00	43.15	42.00	41.50	41.00	40.00	39.00	37.00
Foundry steel, 1 ft and less	21	48.00	48.00	47.00	46.50	46.00	45.00	45.15	44.00	43.50	43.00	42.00	41.00	39.00
Heavy trimmings	24	43.00	43.00	42.00	41.50	41.00	40.00	40.15	39.00	38.50	38.00	37.00	36.00	34.00
No. 1 RR heavy melting	RR 1	46.00	46.00	45.00	44.50	44.00	43.00	43.15	42.00	41.50	41.00	40.00	39.00	37.00
Scrap rails, random lengths	RR 14	48.00	48.00	47.00	46.50	46.00	45.00	45.15	44.00	43.50	43.00	42.00	41.00	39.00
Scrap rails, 3 ft and less	RR 16	51.00	51.00	50.00	49.50	49.00	48.00	48.15	47.00	46.50	46.00	45.00	44.00	42.00
Scrap rails, 2 ft and less	RR 17	52.00	52.00	51.00	50.50	50.00	49.00	49.15	48.00	47.50	47.00	46.00	45.00	43.00
Scrap rails, 18 in. and less	RR 18	54.00	54.00	53.00	52.50	52.00	51.00	51.15	50.00	49.50	49.00	48.00	47.00	45.00
Rerolling rails	RR 15	53.00	53.00	52.00	51.50	51.00	50.00	50.15	49.00	48.50	48.00	47.00	46.00	44.00
Uncut tires	RR 20	48.00	48.00	47.00	46.50	46.00	45.00	45.15	44.00	43.50	43.00	42.00	41.00	39.00
Cut tires	RR 21	51.00	51.00	50.00	49.50	49.00	48.00	48.15	47.00	46.50	46.00	45.00	44.00	42.00
Cut bolsters and side frames	RR 23	49.00	49.00	48.00	47.50	47.00	46.00	46.15	45.00	44.50	44.00	43.00	42.00	40.00
RR specialties	RR 24, 28, 29	51.00	51.00	50.00	49.50	49.00	48.00	48.15	47.00	46.50	46.00	45.00	44.00	42.00
Solid steel axles	RR 25	58.00	58.00	57.00	56.50	56.00	55.00	55.15	54.00	53.50	53.00	52.00	51.00	49.00
No. 3 steel wheels	RR 27	51.00	51.00	50.00	49.50	49.00	48.00	48.15	47.00	46.50	46.00	45.00	44.00	42.00

Cast Scrap

(F.o.b. all shipping points)

Grades	OPS No.	
Cupola cast	1	$49.00
Charging box cast	2	47.00
Heavy breakable cast	3	45.00
Cast iron brake shoes	5	41.00
Stove plate	6	46.00
Clean auto cast	7	52.00
Unstripped motor blocks	8	43.00
Cast iron carwheels	9	47.00
Malleable	10	55.00
Drop broken mach'y. cast	11	52.00

Ceiling price of clean cast iron foundry runouts or prepared cupola drops is 75 pct of corresponding grade.

SWITCHING DISTRICTS—These basing points include the indicated switching districts: Pittsburgh; Bessemer, Homestead, Duquesne, Munhall. Cincinnati; Newport. St. Louis; Granite City, East St. Louis, Madison, and Federal, Ill. San Francisco; South San Francisco, Niles, Oakland. Claymont; Chester. Chicago; Gary.

SHIPPING POINT PRICES (Except RR scrap)—For shipping points within basing points, the ceiling shipping point price is the basing point price, less switching charge. The ceiling for shipping points outside basing points is the basing point price yielding the highest shipping point price, less the lowest established freight charge. Dock charge, where applicable, is $1.25 per gross ton except: Memphis, 95¢; Great Lakes ports, $1.50, and New England ports, $1.75. Maximum shipping point price on No. 1 heavy melting steel in New York City is $36.99 per gross ton with set differentials for other grades. Hudson and Bergen County, N. J., shipping point prices are computed from Bethlehem basing point. All New Jersey computations use all-rail transport. Ceiling need not fall below $32 per gross ton for No. 1 heavy melting steel, with set differentials for other grades. Cast scrap shipping point prices are given in table.

DELIVERED PRICES (RR scrap) — Ceiling on-line price of a RR operating in a basing point is the top in the highest priced basing point in which the RR operates. For off-line prices, RR's not operating in basing point, non-operating RR's, and RR scrap sold by someone other than a RR see text of order, THE IRON AGE, Feb. 8, 1951, p. 137-C.

DELIVERED PRICES (Except RR scrap)—Ceiling is the shipping point price plus actual freight charge, tax included. Dock charges, where applicable, are as above.

UNPREPARED SCRAP—Ceiling price is $8 a ton less than prepared base grades (No. 1 heavy & No. 1 RR heavy). Scrap suitable for compressing into No. 1 bundles is $6 less than No. 1 bundles; suitable for compressing into No. 2 bundles, $8 less than No. 2 bundles. For cast material requiring special preparation, price is breakable cast less preparation costs.

COMMISSIONS—Brokers are permitted a maximum of $1 per gross ton commission which must be separate on the bill.

ALLOY PREMIUMS—These alloy extras are permitted: Nickel; $1.25 may be added to price of No. 1 heavy for each 0.25 pct nickel between 1 and 5.25 pct. **Molybdenum**; $2 may be added to price of No. 1 heavy for molybdenum over 0.15 pct, $3 for content over 0.65 pct. **Manganese**; $4 may be added to price of No. 1 heavy or No. 1 RR heavy for content over 10 pct if scrap is in sizes over 8 x 12 x 24 in., $14 if less than 8 x 12 x 24 in. Manganese premium applicable only if sold for electric furnace use or on NPA allocation. **Silicon**: electric furnace and foundry grade adjustments are not applicable if silicon content is between 0.5 and 1.75 pct. **Chromium**: $1 may be added if scrap conforms to SAE 52100 analysis. **Multiple Alloys**; if scrap contains two premium alloy elements, total premium may not exceed ceiling premium for any one contained alloy.

RESTRICTONS ON USE—Ceiling prices on some scrap items may fluctuate with use by consumers. If some scrap is purchased for its established specialized use, the ceiling price set in the order stands. But if some special grades are purchased for other uses, the ceiling price charge shall be the price of the scrap grade being substituted. For example, the price established for Grade 28 (wrought iron) may be charged only when sold to a producer of wrought iron. Otherwise the ceiling price shall not exceed the ceiling price for the corresponding grade of basic openhearth. Restrictions on use are placed on the following grades: Chemical borings, wrought iron and rerolling rails, cupola cast, billet, bloom, and forge crops, Nos. 1 and 2 chemical borings. Ceiling prices on billet bloom and forge crops, alloy-free turnings, and heavy turnings may be charged only when shipped directly from industrial producer. NPA prohibits openhearth users from buying electric furnace grades, Nos. 11 through 18, foundry grades, Nos. 20 and 21 and cast grades, 1, 7, 9 and 11.

CEILING INTRANSIT PREPARATION CHARGES (Dollars per gross ton)

No. 1 heavy; No. 2 heavy; No. 1 RR heavy; No. 2 RR heavy; No. 1 busheling; No. 2 bundles; electric furnace bundles	$ 8.00
No. 1 bundles; briquetted turnings or cast iron borings; No. 1 RR sheet scrap	6.00
Crushing machine shop turnings	3.00
Bar crops and plate, cast steel, punchings and plate, cut structural and plate, 3 ft and under, foundry steel, 2 ft and under, wrought iron	10.00
Structural, plate scrap, 2 ft and less, foundry steel 1 ft and less	11.00
Structural and plate scrap, 1 ft and less	12.00
Rails, 3 ft & less; cut tires; cut bolsters & side frames	4.00
Rails, 2 ft & less	5.00
Rails, 18 in. & less	7.00

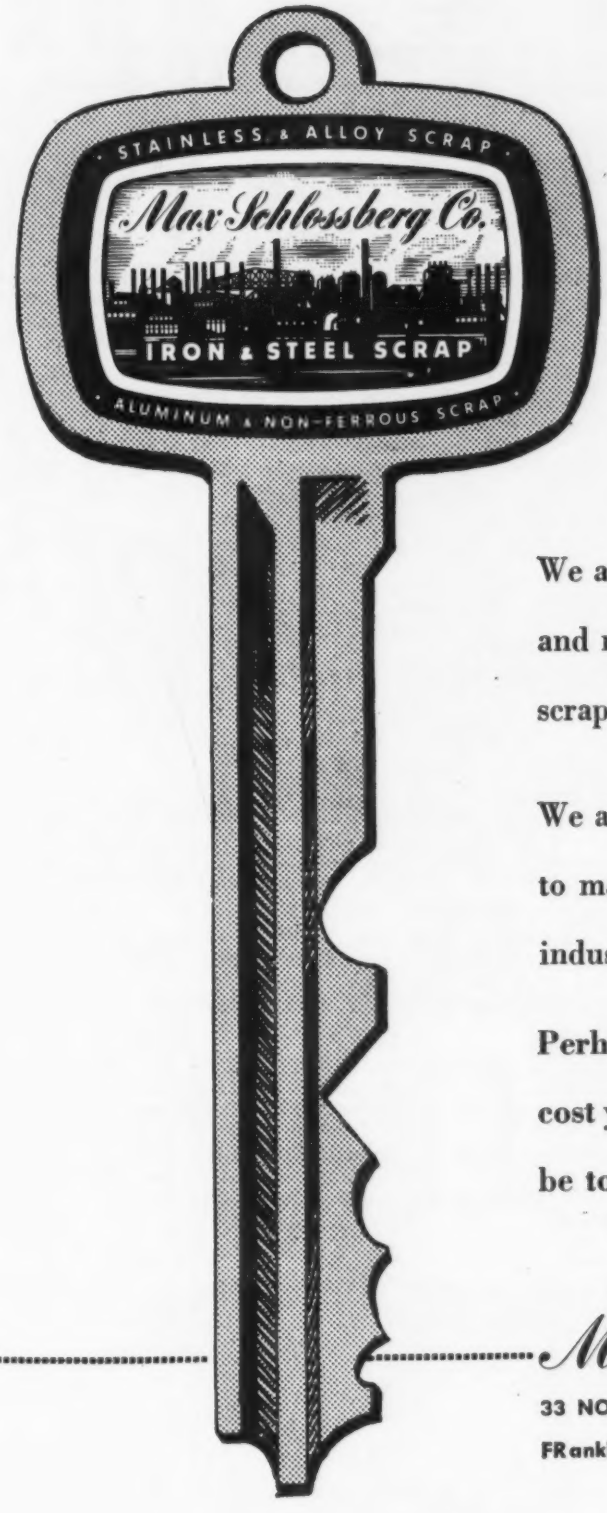
Hamilton, Ontario

(Consumers buying prices, del'd gross ton)

Hvy. melting steel	$35.00
No. 1 bundles	35.00
No. 2 bundles	34.50
Mechanical bundles	33.00
Mixed, steel scrap	31.00
Rails, remelting	35.00
Rails, rerolling	38.00
Bushelings	29.50
Bushelings, prepared new factory	33.00
Bushelings, unprepared new factory	28.00
Short steel turnings	28.00
Mixed borings, turnings	28.00
Cast scrap	58.00 to 60.00

The Key to . . .

Service and Dependability



We are brokers and dealers in ferrous and non-ferrous metals—both in scrap and semi-finished form.

We are today rendering efficient service to many of America's leading industrial scrap sources.

Perhaps we can help you, too. It will cost you nothing to inquire—it may be to your disadvantage—not to!

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Comparison of Prices

Steel prices in this page are the average of various f.o.b. quotations of major producing areas: Pittsburgh, Chicago, Gary, Cleveland, Youngstown.

Flat-Rolled Steel: (cents per pound)	July 10, 1951	July 3, 1951	June 12, 1951	July 11 1950
Hot-rolled sheets	3.60	3.60	3.60	3.35
Cold-rolled sheets	4.35	4.35	4.35	4.10
Galvanized sheets (10 ga)	4.80	4.80	4.80	4.40
Hot-rolled strip	3.50	3.50	3.50	3.25
Cold-rolled strip	4.75	4.75	4.75	4.21
Plate	3.70	3.70	3.70	3.50
Plates wrought iron	7.85	7.85	7.85	7.85
Stains C-R-strip (No. 302)	36.75	36.75	36.50	33.00
Tin and Ternplate: (dollars per base box)				
Tinplate (1.50 lb.) cokes.	$8.70	$8.70	$8.70	$7.50
Tinplate, electro (0.50 lb.)	7.40	7.40	7.40	6.60
Special coated mfg. ternes	7.50	7.50	7.50	6.35
Bars and Shapes: (cents per pound)				
Merchant bars	3.70	3.70	3.70	3.45
Cold finished bars	4.55	4.55	4.55	4.145
Alloy bars	4.30	4.30	4.30	3.95
Structural shapes	3.65	3.65	3.65	3.40
Stainless bars (No. 302)	31.50	31.50	31.25	28.50
Wrought iron bars	9.50	9.50	9.50	9.50
Wire: (cents per pound)				
Bright wire	4.85	4.85	4.85	4.50
Rails: (dollars per 100 lb)				
Heavy rails	$3.60	$3.60	$3.60	$3.40
Light rails	4.00	4.00	4.00	3.75
Semifinished Steel: (dollars per net ton)				
Rerolling billets	$56.00	$56.00	$56.00	$54.00
Slabs, rerolling	56.00	56.00	56.00	54.00
Forging billets	66.00	66.00	66.00	63.00
Alloy blooms billets, slabs	70.00	70.00	70.00	66.00
Wire Rod and Skelp: (cents per pound)				
Wire rods	4.10	4.10	4.10	3.85
Skelp	3.35	3.35	3.35	3.15

Price advances over previous week are printed in Heavy Type; declines appear in *Italics*

Pig Iron: (per gross ton)	July 10, 1951	July 3, 1951	June 12, 1951	July 11 1950
No. 2 foundry, del'd Phila.	$57.77	$57.77	$57.77	$50.42
No. 2, Valley furnace	52.50	52.50	52.50	46.50
No. 2, Southern Cin'ti	55.58	55.58	55.58	49.08
No. 2, Birmingham	48.88	48.88	48.88	42.38
No. 2, foundry, Chicago†	52.50	52.50	52.50	46.50
Basic del'd Philadelphia	56.92	56.92	56.92	49.92
Basic, Valley furnace	52.00	52.00	52.00	46.00
Malleable, Chicago†	52.50	52.50	52.50	46.50
Malleable, Valley	52.50	52.50	52.50	46.50
Charcoal, Chicago	70.56	70.56	70.56	68.56
Ferromanganese‡	186.25	186.25	186.25	173.40

†The switching charge for delivery to foundries in the Chicago district is $1 per ton.
‡Average of U. S. prices quoted on Ferroalloy page.

Scrap: (per gross ton)				
No. 1 steel, Pittsburgh	$44.00*	$44.00*	$44.00*	$41.75
No. 1 steel, Phila. area	42.50*	42.50*	42.50*	32.50
No. 1 steel, Chicago	42.50*	42.50*	42.50*	37.00
No. 1 bundles, Detroit	41.15*	41.15*	41.15*	36.00
Low phos. Young'n	46.50*	46.50*	46.50*	42.75
No 1 cast, Pittsburgh	49.00†	49.00†	49.00†	43.75
No. 1 cast, Philadelphia	49.00†	49.00†	49.00†	38.50
No. 1, cast Chicago	49.00†	49.00†	49.00†	45.50

*Basing Pt. †Shipping Pt.
Not including broker's fee after Feb. 7, 1951.

Coke: Connellsville: (per net ton at oven)				
Furnace coke, prompt	$14.75	$14.75	$14.75	$14.25
Foundry coke, prompt	17.75	17.75	17.75	16.25
Nonferrous Metals: (cents per pound to large buyers)				
Copper, electro, Conn.	24.50	24.50	24.50	22.50
Copper, Lake, Conn.	24.625	24.625	24.625	22.625
Tin, Straits, New York	$1.06†	$1.06	$1.29	84.75
Zinc, East St. Louis	17.50	17.50	17.50	15.00
Lead, St. Louis	16.80	16.80	16.80	10.80
Aluminum, virgin	19.00	19.00	19.00	17.50
Nickel, electrolytic	59.58	59.58	59,58	51.22
Magnesium, ingot	24.50	24.50	24.50	21.50
Antimony, Laredo, Tex.	42.00	42.00	42.00	24.50

†Tentative. *Revised.

Composite Prices

Starting with the issue of May 12, 1949, the weighted finished steel composite was revised for the years 1941 to date. The weights used are based on the average product shipments for the 7 years 1937 to 1940 inclusive and 1946 to 1948 inclusive. The use of quarterly figures has been eliminated because it was too sensitive. (See p. 130 of May 12, 1949, issue.)

	Finished Steel Base Price	Pig Iron	Scrap Steel
July 10, 1951	4.131¢ per lb.	$52.69 per gross ton	$43.00 per gross ton
One week ago	4.131¢ per lb.	52.69 per gross ton	43.00 per gross ton
One month ago	4.131¢ per lb.	52.69 per gross ton	43.00 per gross ton
One year ago	3.837¢ per lb.	46.38 per gross ton	37.08 per gross ton

	Finished Steel Base Price High	Finished Steel Base Price Low	Pig Iron High	Pig Iron Low	Scrap Steel High	Scrap Steel Low
1951	4.131¢ Jan. 2	4.131¢ Jan. 2	$52.69 Jan. 2	$52.69 Jan. 2	$47.75 Jan. 30	$43.00 Feb. 7
1950	4.131¢ Dec. 1	3.837¢ Jan. 3	52.69 Dec. 12	45.88 Jan. 3	45.13 Dec. 19	26.25 Jan. 3
1949	3.837¢ Dec. 27	3.3705¢ May 3	46.87 Jan. 18	45.88 Sept. 6	43.00 Jan. 4	19.33 June 28
1948	3.721¢ July 27	3.193¢ Jan. 1	46.91 Oct. 12	39.58 Jan. 6	43.16 July 27	39.75 Mar. 9
1947	3.193¢ July 29	2.848¢ Jan. 1	37.98 Dec. 30	30.14 Jan. 7	42.58 Oct. 28	29.50 May 20
1946	2.848¢ Dec. 31	2.464¢ Jan. 1	30.14 Dec. 10	25.37 Jan. 1	31.17 Dec. 24	19.17 Jan. 1
1945	2.464¢ May 29	2.396¢ Jan. 1	25.37 Oct. 23	23.61 Jan. 2	19.17 Jan. 2	18.92 May 22
1944	2.396¢	2.396¢	$23.61	$23.61	19.17 Jan. 11	15.76 Oct. 24
1943	2.396¢	2.396¢	23.61	23.61	$19.17	$19.17
1942	2.396¢	2.396¢	23.61	23.61	19.17	19.17
1941	2.396¢	2.396¢	$23.61 Mar. 20	$23.45 Jan. 2	$22.00 Jan. 7	$19.17 Apr. 10
1940	2.30467¢ Jan. 2	2.24107¢ Apr. 16	23.45 Dec. 23	22.61 Jan. 2	21.83 Dec. 30	16.04 Apr. 9
1939	2.35367¢ Jan. 3	2.26689¢ May 16	22.61 Sept. 19	20.61 Sept. 12	22.50 Oct. 3	14.08 May 16
1938	2.58414¢ Jan. 4	2.27207¢ Oct. 18	23.25 June 21	19.61 July 6	15.00 Nov. 22	11.00 June 7
1937	2.58414¢ Mar. 9	2.32263¢ Jan. 4	32.25 Mar. 9	20.25 Feb. 16	21.92 Mar. 30	12.67 June 9
1936	2.32263¢ Dec. 28	2.05200¢ Mar. 10	19.74 Nov. 24	18.73 Aug. 11	17.75 Dec. 21	12.67 June 8
1932	1.89196¢ July 5	1.83910¢ Mar. 1	14.81 Jan. 5	13.56 Dec. 6	8.50 Jan. 12	6.43 July 5
1929	2.31773¢ May 28	2.26498¢ Oct. 29	18.71 May 14	18.21 Dec. 17	17.58 Jan. 29	14.08 Dec. 8

Weighted index based on steel bars, shapes, plates, wire, rails, black pipe, hot and cold-rolled sheets and strips, representing major portion of finished steel shipment. Index recapitulated in Aug. 28, 1941, issue and in May 12, 1949.

Based on averages for basic iron at Valley furnaces and foundry iron at Chicago, Philadelphia, Buffalo, Valley and Birmingham.

Average of No. 1 heavy melting steel scrap delivered to consumers at Pittsburgh, Philadelphia and Chicago.

for

BORON STEELS

WITH FINE GRAIN SIZE

USE *Grainal* ALLOYS

Grain growth inhibitors in metallurgically determined amounts are included . . . in addition to boron . . . among the elements composing Grainal alloys.

Because of the beneficial influence of these additional elements, boron steels made with Grainal alloys maintain finer grain size at higher temperatures than is the case of boron steels made without inhibitors.

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MAKERS OF ALLOYS

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CHEMICALS AND METALS

IRON AGE

STEEL PRICES

Smaller numbers in price boxes indicate producing companies. For main office locations, see key on facing page.
Base prices at producing points apply only to sizes and grades produced in these areas. Prices are in cents per lb unless otherwise noted. Extras apply.

	Pittsburgh	Chicago	Gary	Cleveland	Canton Massillon	Middletown	Youngstown	Bethlehem	Buffalo	Conshohocken	Johnstown	Sparrows Point	Granite City	Detroit
INGOTS Carbon forging, net ton	$52.00[1]													
Alloy, net ton	$54.00[1,17]													$54.00[31]
BILLETS, BLOOMS, SLABS Carbon, rerolling, net ton	$56.00[1,5]	$56.00[1]	$56.00[1]						$56.00[3]		$56.00[3]			
Carbon forging billets, net ton	$66.00[1,5]	$66.00[1,4]	$66.00[1]	$66.00[4]	$66.00[4]				$66.00[3,4]	$73.00[26]	$66.00[3]			$69.00[31]
Alloy, net ton	$70.00[1,17,6]	$70.00[1,4]	$70.00[1,6]		$70.00[4]			$70.00[3]	$70.00[3,4]	$77.00[26]	$70.00[3]			$73.00[31]
PIPE SKELP	3.35[1] 3.45[5]						3.35[1,4]							
WIRE RODS	4.10[2] 4.30[18]	4.10[2,4,33]	4.10[6]	4.10[2]			4.10[6]		4.10[35]		4.10[3]	4.20[3]		
SHEETS Hot-rolled (18 ga. & hvr.)	3.60[1,5,9,15] 3.75[38]	3.60[5,33]	3.60[1,6,8]	3.60[4,5]		3.60[7]	3.60[1,4,6] 4.00[13]		3.60[3]	4.00[26]		3.60[3]	4.30[22]	3.80[13] 4.40[47]
Cold-rolled	4.35[1,5,9,12,7]		4.35[1,6,8]	4.35[4,5]		4.35[7]	4.35[4,6]		4.35[3]			4.35[3]	5.05[22]	4.55[13]
Galvanized (10 gage)	4.80[1,9,18]		4.80[1,8]		4.80[4]	4.80[7]	5.50[44] 6.00[54]					4.80[3]	5.80[22]	
Enameling (12 gage)	4.65[1]		4.65[1,8]	4.65[4]		4.65[7]	4.65[6]						5.35[22]	
Long terne (10 gage)	5.20[9,15]		5.20[1]			5.20[7]	6.00[54]							
Hi str. low alloy, h.r.	5.40[1,5] 5.75[9]	5.40[1]	5.40[1,6] 5.90[6]	5.40[4,5]			5.40[1,4,13] 5.90[6]		5.40[3]	5.65[26]		5.40[3]		5.85[13]
Hi str. low alloy, c.r.	6.55[1,5] 6.90[9]		6.55[1,6] 7.05[6]	6.55[4,5]			6.55[4] 7.05[6]		6.55[3]			6.55[3]		7.10[13]
Hi str. low alloy, galv.	7.20[1]											6.75[3]		
STRIP Hot-rolled	3.60[9], 4.00[41,58], 3.75[38] 3.50[5,7]	3.50[5,6]	3.50[1,6,8]			3.50[7]	3.50[1,4,6] 4.00[13]		3.50[3,4]	3.90[26]	3.50[3]	3.50[3]		4.40[47] 3.80[13]
Cold-rolled	4.65[5,7,9] 5.00[38] 5.35[40,63,68]	4.90[5,66]	4.90[6]	4.65[2,5]		4.65[7]	4.65[4,6] 5.25[48,49] 5.35[13,40]		4.65[3]			4.65[3]		4.85[13] 5.45[47] 5.60[64,41]
Hi str. low alloy, h.r.	5.75[9]		5.50[1] 5.30[5]-5.80[6]				4.95[4]-5.50[1] 5.40[13], 5.80[6]		4.95[3]	5.55[26]		4.95[3]		5.95[13]
Hi str. low alloy, c.r.	7.20[9]			6.55[2] 6.70[5]			6.20[4], 6.55[13] 7.05[6]		6.40[3]			6.40[3]		
TINPLATE† Coke, 1.25-lb base box (1.50 lb, add 25¢)	$8.45[1,5,9,15]		$8.45[1,6,8]				$8.45[4]					$8.55[3]		
Electrolytic 0.25, 0.50, 0.75 lb box	0.25 lb base box, $7.15[1,4,5,8,9]; $7.25[3,11]; $7.35[22] 0.50 lb, add 25¢; 0.75 lb add 65¢													
BLACKPLATE, 29 gage Hollowware enameling	5.85[1] 6.15[18]		5.85[1]				5.30[4]							
BARS Carbon steel	3.70[1,5] 3.85[9]	3.70[1,4,33]	3.70[1,4,6,8]	3.70[4]	3.70[4]		3.70[1,4,6]		3.70[3,4]		3.70[3]			3.85[31]
Reinforcing	3.70[1,5]	3.70[4]	3.70[1,6,8]	3.70[4]			3.70[1,4,6]		3.70[3,4]		3.70[3]	3.70[3]		
Cold-finished	4.55[2,4,5,52,69,71]	4.55[2,33,70]	4.55[4,74,73]	4.55[2]	4.55[4,52]		4.55[6,57]		4.60[70]					4.70[4]
Alloy, hot-rolled	4.30[1,17]	4.30[1,4,33]	4.30[1,6,8]		4.30[4]		4.30[1,6]	4.30[3]	4.30[3,4]		4.30[3]			4.45[31] 4.65[12]
Alloy, cold-drawn	5.40[17,52,69,71,2]	5.40[4,33,69,70,73] 5.45[2]	5.40[4,73,74]		5.40[4,33]		5.40[6,26,57]	5.40[3]	5.40[3]					5.55[34]
Hi str. low alloy, h.r.	5.55[1,5]		5.55[1,6] 6.05[6]	5.55[4,5]			5.55[1] 6.05[6]	5.55[3]	5.55[3]		5.55[3]			
PLATE Carbon steel	3.70[1,5,15] 4.00[9]	3.70[1,33]	3.70[1,6,8]	3.70[4,5]			3.70[1,4,6] 3.95[13]		3.70[3]	4.15[26]	3.70[3]	3.70[3]	4.40[22]	
Floor plates	4.75[1]	4.75[1]	4.75[6]	4.75[5]						4.75[26]				
Alloy	4.75[1]	4.75[1]	4.75[1]				5.20[13]			5.05[26]	4.75[3]	4.75[3]		
Hi str. low alloy	5.65[1,5]	5.65[1]	5.65[1,6] 6.15[6]	5.65[4,5]			5.65[4] 5.70[13] 6.15[6]			5.90[26]	5.65[3]	5.65[3]		
SHAPES, Structural	3.65[1,5] 3.90[9]	3.65[1,33]	3.65[1,6]					3.70[3]	3.70[3]		3.70[3]			
Hi str. low alloy	5.50[1,5]	5.50[1]	5.50[1,6] 6.00[6]				6.00[6]	5.50[3]	5.50[3]		5.50[3]			
MANUFACTURERS' WIRE Bright	4.85[2,5] 5.10[18]	4.85[2] 4.55,34		4.85[2]			4.85[6]	Kokomo—4.95[10] 4.85[35]			4.85[3]	4.95[3]	Duluth—4.85[3]	
PILING, Steel Sheet	4.45[1]	4.45[1]	4.45[6]						4.45[3]					

STEEL PRICES

Smaller numbers indicate producing companies. See key at right. Prices are in cents per lb unless otherwise noted. Extras apply.

Kansas City	Houston	Birmingham	WEST COAST Seattle, San Francisco, Los Angeles, Fontana		
			F=$79.00[10]		INGOTS Carbon forging, net ton
	$62.00[83]		F=$80.00[10]		Alloy, net ton
		$56.00[11]	F=$75.00[10]		BILLETS, BLOOMS, SLABS Carbon, rerolling, net ton
	$74.00[83]	$66.00[11]	F=$85.00[10] SF, LS, S=$85.00[62]	Geneva=$66.00[16]	Carbon forging billets, net ton
	$78.00[83]		F=$89.00[10] LA=$90.00[62]		Alloy net ton
					PIPE SKELP
	4.50[83]	4.10[4,11]	SF=4.90[2], F=4.90[19] LA=4.90[24,62]	Worcester=4.40[2] Minnequa=4.35[14] Portsmouth=4.30[20]	WIRE RODS
		3.60[4,11]	SF, LA=4.30[24] F=4.55[19]	Niles=5.25[84], Geneva=3.70[16] Ashland=3.60[7]	SHEETS Hot-rolled (18 ga. & hvr.)
		4.35[11]	SF=5.30[24] F=5.30[19]		Cold-rolled
		4.80[4,11]	SF, LA=5.55[24]	Ashland=4.80[7] Kokomo=5.20[30]	Galvanized (10 gage)
				Ashland=4.65[7]	Enameling (12 gage)
					Long ternes (10 gage)
		5.40[11]	F=6.35[19]		Hi str. low alloy, h.r.
			F=7.50[19]		Hi str. low alloy, c.r.
					Hi str. low alloy, galv.
4.10[83]	4.90[83]	3.50[4,11]	SF, LA=4.25[24,62] F=4.75[19], S=4.50[62]	Atlanta=4.05[65] Minnequa=4.55[14] Ashland=3.50[7]	STRIP Hot-rolled
			F=6.30[19] LA=6.40[27]	New Haven=5.15[2], 5.35[58] Trenton=6.00[45]	Cold-rolled
		5.30[11]	F=6.20[19] SF, LA=6.05[62] S=6.30[62]		Hi str. low alloy, h.r.
			F=6.95[19]		Hi str. low alloy, c.r.
		$8.55[11]	SF=9.20[24]		TINPLATE Cokes, 1.25-lb base box (1.50 lb, add 25¢)
					Electrolytic 0.25, 0.50, 0.75 lb box
					BLACKPLATE, 29 gage Hollowware enameling
4.30[83]	4.10[83]	3.70[4,11]	SF, LA=4.40[24]	Atlanta=4.25[65] Minnequa=4.15[14]	BARS Carbon steel
4.30[83]	4.10[83]	3.70[4,11]	SF, S=4.45[62] F=4.40[19], LA=4.40[62]	Atlanta=4.25[65] Minnequa=4.50[14]	Reinforcing
			LA=6.00[4]	Newark=5.00[69] Putnam=5.10[69] Hartford=5.10[4]	Cold-finished
4.90[83]	4.70[83]		LA=5.35[62] F=5.35[19]		Alloy, hot-rolled
				Newark=5.75[69] Worcester=5.75[2] Hartford=5.85[4]	Alloy, cold-drawn
		5.55[11]	F=6.60[19] SF, S=6.30[62] LA=6.25[62]		Hi str. low alloy, h.r.
	4.10[83]	3.70[4,11]	F=4.30[19] S=4.60[62]	Claymont=4.15[29] Coatesville=4.15[21] Minnequa=4.50[14] Geneva=3.70[16]	PLATE Carbon steel
				Harrisburg=5.25[35]	Floor plates
			F=5.70[19]	Coatesville=5.25[21] Claymont=4.85[29]	Alloy
		5.65[11]	F=6.25[19] S=6.55[62]	Geneva=5.65[16]	Hi str. low alloy
4.25[83]	4.05[83]	3.60[4] 3.65[11]	SF=4.20[63] F=4.25[16] LA=4.25[24,62] S=4.30[62]	Geneva 3.65[16] Minnequa 4.10[14]	SHAPES, Structural
		5.50[11]	SF=6.10[62,19] SF=6.00[62] LA=6.05[62]	Geneva=5.50[16]	Si str. low alloy
5.45[83]	5.25[83]	4.85[4,11]	SF, LA=5.80[24]	Atlanta=5.10[65] Worcester=5.15[2] Minnequa=5.10[14] Portsmouth=5.25[20]	MANUFACTURERS' WIRE Bright

†Special coated mfg ternes deduct 95¢ from 1.25-lb coke base box price. Can-making quality blackplate, 55 to 128-lb, deduct $2.20 from 1.25-lb coke base box.

Key to Steel Producers

1 U. S. Steel Co., Pittsburgh
2 American Steel & Wire Co., Cleveland
3 Bethlehem Steel Co., Bethlehem
4 Republic Steel Corp., Cleveland
5 Jones & Laughlin Steel Corp., Pittsburgh
6 Youngstown Sheet & Tube Co., Youngstown
7 Armco Steel Corp., Middletown, Ohio
8 Inland Steel Co., Chicago
9 Weirton Steel Co., Weirton, W. Va.
10 National Tube Co., Pittsburgh
11 Tennessee Coal, Iron & R. R. Co., Birmingham
12 Great Lakes Steel Corp., Detroit
13 Sharon Steel Corp., Sharon, Pa.
14 Colorado Fuel & Iron Corp., Denver
15 Wheeling Steel Corp., Wheeling, W. Va.
16 Geneva Steel Co., Salt Lake City
17 Crucible Steel Co. of America, New York
18 Pittsburgh Steel Co., Pittsburgh
19 Kaiser Steel Corp., Oakland, Calif.
20 Portsmouth Div., Detroit Steel Corp., Detroit
21 Lukens Steel Co., Coatesville, Pa.
22 Granite City Steel Co., Granite City, Ill.
23 Wisconsin Steel Co., South Chicago, Ill.
24 Columbia Steel Co., San Francisco
25 Copperweld Steel Co., Glassport, Pa.
26 Alan Wood Steel Co., Conshohocken, Pa.
27 Calstrip Steel Corp., Los Angeles
28 Allegheny Ludlum Steel Corp., Pittsburgh
29 Claymont Steel Corp., Claymont, Del.
30 Continental Steel Corp., Kokomo, Ind.
31 Rotary Electric Steel Co., Detroit
32 Laclede Steel Co., St. Louis
33 Northwestern Steel & Wire Co., Sterling, Ill.
34 Keystone Steel & Wire Co., Peoria, Ill.
35 Central Iron & Steel Co., Harrisburg, Pa.
36 Carpenter Steel Co., Reading, Pa.
37 Eastern Stainless Steel Corp., Baltimore
38 Washington Steel Corp., Washington, Pa.
39 Jessop Steel Co., Washington, Pa.
40 Blair Strip Steel Co., New Castle, Pa.
41 Superior Steel Corp., Carnegie, Pa.
42 Timken Steel & Tube Div., Canton, Ohio
43 Babcock & Wilcox Tube Co., Beaver Falls, Pa.
44 Reeves Steel & Mfg. Co., Dover, Ohio
45 John A. Roebling's Sons Co., Trenton, N. J.
46 Simonds Saw & Steel Co., Fitchburg, Mass.
47 McLouth Steel Corp., Detroit
48 Cold Metal Products Co., Youngstown
49 Thomas Steel Co., Warren, Ohio
50 Wilson Steel & Wire Co., Chicago
51 Sweet's Steel Co., Williamsport, Pa.
52 Superior Drawn Steel Co., Monaca, Pa.
53 Tremont Nail Co., Wareham, Mass.
54 Firth Sterling St. & Carbide Corp., McKeesport
55 Ingersoll Steel Div., Chicago
56 Phoenix Iron & Steel Co., Phoenixville, Pa.
57 Fitzsimons Steel Co., Youngstown
58 Stanley Works, New Britain, Conn.
59 Universal-Cyclops Steel Corp., Bridgeville, Pa.
60 American Cladmetals Co., Carnegie, Pa.
61 Cuyahoga Steel & Wire Co., Cleveland
62 Bethlehem Pacific Coast Steel Corp., San Fran.
63 Follansbee Steel Corp., Pittsburgh
64 Niles Rolling Mill Co., Niles, Ohio
65 Atlantic Steel Co., Atlanta
66 Acme Steel Co., Chicago
67 Joslyn Mfg. & Supply Co., Chicago
68 Detroit Steel Corp., Detroit
69 Wycoff Steel Co., Pittsburgh
70 Bliss & Laughlin, Inc., Harvey, Ill.
71 Columbia Steel & Shafting Co., Pittsburgh
72 Cumberland Steel Co., Cumberland, Md.
73 La Salle Steel Co., Chicago
74 Monarch Steel Co., Inc., Hammond, Ind.
75 Empire Steel Co., Mansfield, Ohio
76 Mahoning Valley Steel Co., Niles, Ohio
77 Oliver Iron & Steel Co., Pittsburgh
78 Pittsburgh Screw & Bolt Co., Pittsburgh
79 Standard Forging Corp., Chicago
80 Driver Harris Co., Harrison, N. J.
81 Detroit Tube & Steel Div., Detroit
82 Reliance Div., Eaton Mfg. Co., Massillon, Ohio
83 Sheffield Steel Corp., Kansas City
84 Plymouth Steel Co., Detroit
85 Wickwire Spencer Steel, Buffalo
86 Angell Nail and Chaplet, Cleveland
87 Mid-States Steel & Wire, Crawfordsville, Ind
88 National Supply, Pittsburgh, Pa.
89 Wheatland Tube Co., Wheatland, Pa.
90 Mercer Tube & Mfg. Co., Sharon, Pa.
91 Woodward Iron Co., Woodward, Ala.
92 Sloss-Sheffield Steel & Iron Co., Birmingham
93 Hanna Furnace Corp., Detroit
94 Interlake Iron Corp., Cleveland
95 Lone Star Steel Co., Dallas
96 Mystic Iron Works, Everett, Mass.
97 Jackson Iron & Steel Co., Jackson, O.
98 Globe Iron Co., Jackson, O.
99 Pittsburgh Coke & Chemical Co., Pittsburgh
100 Shenango Furnace Co., Pittsburgh
101 Tennessee Products & Chem. Corp., Nashville
102 Koppers Co., Inc., Granite City, Ill.
103 Page Steel & Wire Div., American Chain & Cable, Monessen, Pa.
104 Wallingford Steel Co., Wallingford, Conn.

STAINLESS STEELS

Base price cents per lb f.o.b. mill.

Product	301	302	303	304	316	321	347	410	416	430
Ingots rerolling	14.25	15.25	16.75	16.25	24.75	20.00	21.75	12.75	14.75	13.00
Slabs billets rerolling	18.50	20.00	22.00	21.00	32.25	26.25	28.50	16.50	20.00	16.75
Forg. discs die blocks rings	34.00	34.25	36.75	35.75	53.00	40.25	44.75	28.00	28.50	28.50
Billets forging	26.25	26.50	28.50	27.75	41.50	31.25	35.00	21.50	22.00	22.00
Bars wires structurals	31.25	31.50	34.00	33.00	49.25	37.00	41.50	25.75	26.25	26.25
Plates	33.00	33.25	35.25	35.25	52.00	40.75	45.25	27.00	27.50	27.50
Sheets	41.00	41.25	43.25	43.25	57.00	49.25	53.75	36.50	37.00	39.00
Strip hot-rolled	26.50	26.25	32.50	30.25	48.75	37.00	41.25	23.50	30.25	24.00
Strip cold-rolled	34.00	36.75	40.25	38.75	59.00	48.25	52.25	30.50	37.00	31.00

STAINLESS STEEL PRODUCING POINTS—*Sheets:* Midland, Pa., 17; Brackenridge, Pa., 28; Butler, Pa., 7; McKeesport, Pa., 1; Washington, Pa., 38 (type 316 add 4, 5¢), 39; Baltimore, 37; Middletown, Ohio, 7; Massillon, Ohio, 4; Gary, 1; Bridgeville, Pa., 59; New Castle, Ind., 55; Ft. Wayne, Ind., 67; Lockport, N. Y., 45.

Strip: Midland, Pa., 17; Cleveland, 2; Carnegie, Pa., 41; McKeesport, Pa., 54; Reading, Pa., 36; Washington, Pa., 38 (type 316 add 4, 5¢); W. Leechburg, Pa., 28; Bridgeville, Pa., 59; Detroit, 47; Massillon, Canton, Ohio, 4; Middletown, Ohio, 7; Harrison, N. J., 80; Youngstown, 48; Lockport, N. Y., 46; New Britain, Conn., 58; Sharon, Pa., 13; Butler, Pa., 7; Wallingford, Conn., 104.

Bars: Baltimore, 7; Duquesne, Pa., 1; Munhall, Pa., 1; Reading, Pa., 36; Titusville, Pa., 59; Washington, Pa., 39; McKeesport, Pa., 1, 54; Bridgeville, Pa., 59; Dunkirk, N. Y., 28; Massillon, Ohio, 4; Chicago, 1; Syracuse, N. Y., 17; Watervliet, N. Y., 28; Waukegan, Ill., 2; Lockport, N. Y., 46; Canton, Ohio, 42; Ft. Wayne, Ind., 67.

Wire: Waukegan, Ill., 2; Massillon, Ohio, 4; McKeesport, Pa., 54; Bridgeport, Conn., 44; Ft. Wayne, Ind., 67; Trenton, N. J., 45; Harrison, N. J., 80; Baltimore, 7; Dunkirk, 28; Monessen, 103; Syracuse, N. Y., 17; Bridgeville, Pa., 59.

Structurals: Baltimore, 7; Massillon, Ohio, 4; Chicago, 1, 67; Watervliet, N. Y., 28; Bridgeport, Conn., 44; Syracuse, N. Y., 17.

Plates: Brackenridge, Pa., 28 (type 416 add ½¢); Butler, Pa., 7; Chicago, 1; Munhall, Pa., 1; Midland, Pa., 17; New Castle, Ind., 55; Lockport, N. Y., 46; Middletown, 7; Washington, Pa., 39; Cleveland, Massillon, 4.

Forged discs, die blocks, rings: Pittsburgh, 17; Syracuse, 17; Ferndale, Mich., 28; Washington, Pa., 39.

Forging billets: Midland, Pa., 17; Baltimore, 7; Washington, Pa., 39; McKeesport, 54; Massillon, Canton, Ohio, 4; Watervliet, 28; Pittsburgh, Chicago, 1; Syracuse, N. Y., 17.

*ALLEGHENY LUDLUM—Slightly higher on Type 301; slightly lower on others in 300 Series.

WASHINGTON STEEL—Slightly lower on 300 Series except where noted.

MERCHANT WIRE PRODUCTS

F.o.b. Mill	Standard & Coated Nails Base Col.	Woven Wire Fence 9-15½ ga. Base Col.	Fence Posts Base Col.	Single Loop Bale Ties Base Col.	Twisted Barbless Wire Base Col.	Galv. Barbed Wire Base Col.	Merch. Wire Ann'ld ¢/lb.	Merch. Wire Galv. (1) ¢/lb.
Alabama City-4	118	126		123		138	5.70	5.95
Aliquippa, Pa.-5	118	132			136	140	5.70	6.15
Atlanta-65	121	133		126	126	143	5.95	6.40
Bartonville-34	118	130		123	143	143	5.70	6.15
Buffalo-85							4.85	
Cleveland-86	125							
Cleveland-2							5.70	6.15
Crawfordsville-87		132				145	5.95	6.40
Donora, Pa.-2	118	130		123	140	140	5.70	6.15
Duluth-2	118	130		123	140	140	5.70	6.15
Fairfield, Ala.-11	118	130		123		140	5.70	6.15
Houston-83	126	138				148	6.10	6.55
Johnstown, Pa.-3	118	130			140		5.70	6.15
Joliet, Ill.-2	118	130		123		140	5.70	6.15
Kokomo, Ind.-30	120	132		125	138	142	5.80	6.05
Los Angeles-62							6.65	
Kansas City-83	130			135		152	6.30	6.75
Minnequa-14	123	138	130	128	146	146	5.95	6.45
Monessen-18	124	135				145	5.95	6.40
Moline, Ill.-4			136					
Pittsburg, Cal.-24	137			147	156	160	6.65	6.80
Portsmouth-20	124	137			147	147	6.10	6.60
Rankin, Pa.-2	118	130			140	140	5.70	6.15
So. Chicago, Ill.-4	118	126	140	123		136	5.70	5.95
S. San Fran.-14				147		160	6.65	7.10
Sparrows Pt.-3	120			125	142	142	5.80	6.25
Sterling, Ill.-33	118	130		123	140	140	5.70	6.15
Struthers, Ohio-6							5.70	6.15
Torrance, Cal.-24	138						6.65	
Worcester-2	124						6.00	6.45
Williamsport, Pa.-51			150					

Cut Nails, carloads, base, $7.35 per 100 lb (less 20¢ to jobbers), at Conshohocken, Pa., (26), Wheeling, W. Va., (15), $7.15.

(1) Alabama City and So. Chicago do not include zinc extra.

CAST IRON WATER PIPE

	Per Net Ton
6 to 24-in., del'd Chicago	$105.30 to $108.80
6 to 24-in., del'd N. Y.	108.50 to 109.50
6 to 24-in., Birmingham	91.50 to 96.00
6-in and larger, f.o.b. cars, San Francisco, Los Angeles, for all rail shipment; rail and water shipment less	123.00 to 130.00

Class "A" and as pipe, $5 extra; 4-in. pipe is $5 a ton above 6-in.

RAILS, TRACK SUPPLIES

F.o.b. Mill Cents Per Lb	No. 1 Std. Rails	Light Rails	Joint Bars	Track Spikes	Axles	Screw Spikes	Tie Plates	Track Bolts Treated
Bessemer-1	3.60	4.00	4.70					
Chicago-4				6.15				
Ensley-11	3.60	4.00						
Fairfield-11		4.00	4.40			8.60	4.50	
Gary-1	3.60	4.00					4.50	
Ind. Harbor-8	3.60		4.70	6.15	5.60	8.60	4.50	
Johnstown-3		4.00			5.60	8.60		
Joliet-1		4.00	4.70					
Kansas City-83				6.40				9.85
Lackawanna-3	3.60	4.00	4.70			8.60	4.50	
Lebanon-3				6.15				9.85
Minnequa-14	3.60	4.50	4.70	6.15		8.60	4.50	9.85
Pittsburgh-77						9.35		9.85
Pittsburgh-78								9.85
Pittsburgh-5				6.15				
Pittsburgh-24							4.65	
Seattle-62				6.65			4.65	
Steelton-3	3.60		4.70				4.50	
Struthers-6				6.15				
Torrance-24							4.65	
Youngstown-4				6.15				

BOILER TUBES

$ Per 100 ft., cut, 10 to 24 ft.

F.o.b. Mill	Size OD-In.	Size B.W. Ga.	Seamless H.R.	Seamless C.D.	Elec. Weld H.R.	Elec. Weld C.D.
Babcock & Wilcox	2	13	22.67	26.66	21.99	25.88
	2½	12	30.48	35.84	29.57	34.78
	3	12	33.90	39.90	32.89	38.70
	3½	11	42.37	49.88	41.10	48.39
	4	10	52.60	61.88	51.03	60.02
National Tube	2	13	21.62	26.48		
	2½	12	29.65	36.32		
	3	12	34.00	41.64		
	3½	11	40.34	49.41		
	4	10	51.21	62.72		
Pittsburgh Steel	2	13		27.08		
	2½	12	30.49	37.15		
	3	12	34.95	42.59		
	3½	11	41.48	50.54		
	4	10	52.65	64.16		

FLUORSPAR

Washed gravel, f.o.b. Rosiclaire, Ill. Price, net ton; Effective CaF_2 content:

70% or more	$43.00
60% or less	40.00

PIPE AND TUBING

Base discounts, f.o.b. mills. Base price about $200 per net ton.

	BUTTWELD ½ In. Blk.	½ In. Gal.	¾ In. Blk.	¾ In. Gal.	1 In. Blk.	1 In. Gal.	1¼ In. Blk.	1¼ In. Gal.	1½ In. Blk.	1½ In. Gal.	2 In. Blk.	2 In. Gal.	2½-3 In. Blk.	2½-3 In. Gal.	SEAMLESS 2 In. Blk.	2 In. Gal.	2½-3 In. Blk.	2½-3 In. Gal.	3½-4In. Blk.	3½-4In. Gal.
STANDARD T. & C.																				
Sparrows Pt.-3	34.0	12.0	37.0	16.0	39.5	19.5	40.0	20.0	40.5	21.0	41.0	21.5	41.5	22.0						
Cleveland-4	36.0	14.0	39.0	18.0	41.5	21.5	42.9	22.0	42.5	23.0	43.0	23.5	43.5	24.0						
Oakland-19	25.0	3.0	28.0	7.0	30.5	10.5	31.0	11.0	31.5	12.0	32.0	12.5	32.5	13.0						
Pittsburgh-5	36.0	14.0	39.0	17.0	41.5	19.5	42.0	20.5	42.5	21.0	43.0	21.5	43.5	22.5	29.5	8.0	32.5	11.5	34.5	13.5
Pittsburgh-10	36.0	14.0	39.0	18.0	41.5	21.5	42.0	22.0	42.5	23.0	43.0	23.5	43.5	24.0	29.5	9.5	32.5	12.5	34.5	14.5
St. Louis-32	35.0	13.0	38.0	17.0	40.5	20.5	41.0	21.0	41.5	22.0	42.0	22.5	42.5	23.0						
Sharon-90	36.0	13.0	39.0	17.0	41.5	20.0	42.0	20.5	42.5	21.0	43.0	21.5	43.5	22.0						
Pittsburgh-88	36.0	14.0	39.0	18.0	41.5	21.5	42.0	22.0	42.5	23.0	43.0	23.5	43.5	24.0	29.5		32.5		34.5	
Wheeling-15	36.0	14.0	39.0	18.0	41.5	21.5	42.0	22.0	42.5	23.0	43.0	23.5	43.5	24.0						
Wheatland-89	36.0	14.0	39.0	17.0	41.5	19.5	42.0	20.5	42.5	21.0	43.0	21.5	43.5	22.5						
Youngstown-6	36.0	14.0	39.0	18.0	41.5	21.5	42.0	22.0	42.5	23.0	43.0	23.5	43.5	24.0	29.5	9.5	32.5	12.5	34.5	14.5
EXTRA STRONG, PLAIN ENDS																				
Sparrows Pt.-3	33.5	13.0	37.5	17.0	39.5	20.5	40.0	21.0	40.5	22.0	41.0	22.5	41.5	23.0						
Cleveland-4	35.5	15.0	39.5	19.0	41.5	22.5	42.0	23.0	42.5	24.0	43.0	24.5	43.5	25.0						
Oakland-19	24.5	4.0	28.5	8.0	30.5	11.5	31.0	12.0	31.5	13.0	32.0	13.5	32.5	14.0						
Pittsburgh-5	35.5	13.5	39.5	17.5	41.5	19.5	42.0	20.5	42.5	21.0	43.0	21.5	43.5	22.5	29.0	7.5	33.0	12.0	36.5	15.5
Pittsburgh-10	35.5	15.0	39.5	19.0	41.5	22.5	42.0	23.0	42.5	24.0	43.0	24.5	43.5	25.0	29.0	10.0	33.0	14.0	36.5	17.5
St. Louis-32	34.5	14.0	38.5	18.0	40.5	21.5	41.0	22.0	41.5	23.0	42.0	23.5	42.5	24.0						
Sharon-90	35.5	14.0	39.5	18.0	41.5	21.0	42.0	21.5	42.5	22.0	43.0	22.5	43.5	23.0						
Pittsburgh-88	35.5	15.0	39.5	19.0	41.5	22.5	42.0	23.0	42.5	24.0	43.0	24.5	43.5	25.0	29.0		33.0		36.5	
Wheeling-15	35.5	15.0	39.5	19.0	41.5	22.5	42.0	23.0	42.5	24.0	43.0	24.5	43.5	25.0						
Wheatland-89	35.5	13.5	39.5	17.5	41.5	9.5	42.0	20.5	42.5	21.0	43.0	21.5	43.5	22.5						
Youngstown-6	35.5	15.0	39.5	19.0	41.5	22.5	42.0	23.0	42.5	24.0	43.0	24.5	43.5	26.0	29.0	10.0	33.0	14.0	36.5	17.5

Galvanized discounts based on zinc at 17¢ per lb, East St. Louis. For each 1¢ change in zinc, discounts vary as follows: ½ in., ¾ in., and 1 in., 1 pt.; 1¼ in., 1½ in., 2 in., ¾ pt.; 2½ in., 3 in., ½ pt. Calculate discounts on even cents per lb of zinc, i.e., if zinc is 16.51¢ to 17.50¢ per lb, use 17¢. Jones & Laughlin discounts apply only when zinc price changes 1¢.

Threads only, buttweld and seamless, 1 pt. higher discount. Plain ends, buttweld and seamless, 3 in. and under, 3½ pts. higher discount. Buttweld jobbers' discount, 5 pct.

WAREHOUSES

Base price, f.o.b., dollars per 100 lb. *(Metropolitan area delivery add 20¢ except Birmingham, San Francisco, Cincinnati, New Orleans, St. Paul, add 15¢; Memphis, add 10¢; Philadelphia, add 25¢; New York, add 30¢).

Cities	Sheets			Strip		Plates	Shapes	Bars		Alloy Bars			
	Hot-Rolled	Cold-Rolled (15 gage)	Galvanized (10 gage)	Hot-Rolled	Cold-Rolled		Standard Structural	Hot-Rolled	Cold-Finished	Hot-Rolled A 4615 As rolled	Hot-Rolled A 4140 Annealed	Cold-Drawn A 4615 As rolled	Cold-Drawn A 4140 Annealed
Baltimore	5.60	6.84	7.49[2]–8.07	6.04	.....	5.80	6.14	6.04	6.84–6.89	10.24	10.54	11.89	12.19
Birmingham*	5.60	6.40	6.75	5.55	.....	5.95	5.70	5.55	.....	.....	.....	.....	.....
Boston	6.20	7.00–7.25	7.74–8.29	6.15	8.50[4]	6.48–6.78	6.20	6.05	6.79–6.84	10.25	10.55	11.90–12.00	12.20–12.30
Buffalo	5.60	6.40	7.74–8.09	5.86	.....	6.05	5.60	5.60	6.40–6.45	10.15–10.85	10.45	11.90	11.95–12.10
Chicago	5.60	6.40	7.75	5.55	.....	5.80	5.70	5.55	6.30	9.80	10.10	11.45	11.75
Cincinnati*	5.87	6.44	7.39	5.90	.....	6.19	6.09	5.80	6.61	10.15	10.45	11.80	12.10
Cleveland	5.60	6.40	8.10	5.89	6.90	5.92	5.82	5.87	6.40	9.91	10.21	11.56	11.86
Detroit	5.78	6.53	7.89	5.94	.....	5.99	6.09	5.84	6.56	10.11	10.41	11.76	12.06
Houston	7.00	8.25	.....	.....	.....	6.85	6.50	6.65	9.35	10.35	11.25	.....	12.75
Indianapolis, del'd.	6.00	6.80	8.15	5.95	.....	6.29	6.10	5.95	6.80	.....	.....	.....	.....
Kansas City	6.00	6.80	7.45	6.15	7.50	6.40	6.30	6.15	7.00	10.40	10.70	12.05	12.35
Los Angeles	6.35	7.90	8.85	6.40	9.45[6]	6.40	6.35	6.35	8.20	11.30	11.30	13.20	13.50
Memphis*	6.33–6.38	7.06–7.16	.....	6.33–6.38	.....	6.43–8.02	6.33–6.48	6.06–6.33	7.16–7.32	.....	.....	.....	.....
Milwaukee	5.74	6.54	7.89	5.89–6.59	.....	5.94	5.84	5.69	6.44–6.54	9.94	10.24	11.59	11.89
New Orleans*	5.70	6.59	.....	5.75	7.25	5.95	5.75	5.75	7.30	.....	.....	.....	.....
New York*	5.67–5.97	7.19[5]–7.24[1]	8.14[2]	6.29–6.89	8.63[4]	6.28–6.58	6.10	6.12	6.99	10.05–10.15	10.35–10.45	11.70–11.80	12.10–12.20
Norfolk	6.50[3]	.....	.....	.....	.....	6.50[3]	6.60[3]	6.55[3]	.....	.....	.....	.....	.....
Philadelphia*	5.90	6.80	8.00	6.10	.....	6.05	5.90	6.05	6.86	9.90	10.20	.....	.....
Pittsburgh	5.60	6.40	7.75	5.65–5.95	.....	5.75	5.70	5.55	6.15	9.80	10.10	11.45	11.75
Portland	6.60–7.55	8.95	8.50–9.10	7.30	.....	6.80	6.95	6.90	.....	.....	12.15	.....	.....
Salt Lake City	7.95	.....	9.70–10.50[2]	8.70–8.75	.....	8.05	6.75–8.30	7.95–8.65	9.00	.....	.....	.....	.....
San Francisco*	6.65	8.05[2]	8.55–8.90[2]	6.60	9.95[6]	6.50	6.45	6.45	8.20	11.30	11.30	13.20	13.20–13.50
Seattle	7.05	8.60	9.20	9.05	.....	6.75	6.65	6.75	9.05	.....	.....	.....	.....
St. Louis	5.80–5.85	6.65	8.00	5.80	8.00[4]–8.28	6.13	6.03	5.80	6.55–6.65	10.05	10.35	11.70	12.00
St. Paul*	6.16	6.96	8.31	6.11	.....	6.36	6.26	6.11	6.96	10.36	10.66	12.01	12.31

BASE QUANTITIES (Standard unless otherwise keyed): Cold finished bars; 2000 lb or over. Alloy bars; 1000 to 1999 lb. All others; 2000 to 9999 lb. All HR products may be combined for quantity. All galvanized sheets may be combined for quantity. CR sheets may not be combined with each other or with galvanized sheets, for quantity.
EXCEPTIONS: (1) 400 to 1499 lb; (2) 450 to 1499 lb; (3) 400 to 1999 lb; (4) 6000 lb and over; (5) 1500 to 9999 lb; (6) 2000 to 5999 lb.

PIG IRON

Dollars per gross ton, f.o.b., subject to switching charges.

Producing Point	Basic	Foundry	Malleable	Bessemer	Low Phos.	Blast Furnace Silvery	Low Phos. Charcoal
Bethlehem-3	54.00	54.50	55.00	55.50	.....	.....	.....
Birmingham-4	48.38	48.88	.....	.....	.....	.....	.....
Birmingham-91	48.38	48.88	.....	.....	.....	.....	.....
Birmingham-92	48.38	48.88	.....	.....	.....	.....	.....
Buffalo-4	52.00	52.50	53.00	.....	.....	.....	.....
Buffalo-93	52.00	52.50	53.00	.....	.....	63.75	.....
Chicago-94	52.00	52.50	52.50	53.00	.....	.....	.....
Cleveland-2	52.00	52.50	52.50	53.00	57.00	.....	.....
Cleveland-4	52.00	52.50	52.50	.....	.....	.....	.....
Daingerfield, Tex.-95	48.00	48.50	48.50	.....	.....	.....	.....
Duluth-94	52.00	52.50	52.50	53.00	.....	.....	.....
Erie-94	52.00	52.50	52.50	53.00	.....	.....	.....
Everett, Mass.-96	.....	51.75	52.25	.....	.....	.....	.....
Fontana-19	58.00	58.50	.....	.....	.....	.....	.....
Geneva, Utah-16	52.00	52.50	52.50	53.00	.....	.....	.....
Granite City, Ill.-102	53.90	54.40	54.90	.....	.....	.....	.....
Hubbard, Ohio-6	52.00	52.50	52.50	.....	.....	.....	.....
Ironton, Utah-16	52.00	52.50	.....	.....	.....	.....	.....
Jackson, Ohio-97, 98	.....	.....	.....	.....	.....	62.50	.....
Lyle, Tenn.-101	.....	.....	.....	.....	.....	.....	66.00
Monessen-18	54.00	.....	.....	.....	.....	.....	.....
Neville Island-99	52.00	52.50	52.50	53.00	.....	.....	.....
Pittsburgh-1	52.00	.....	.....	53.00	.....	.....	.....
Sharpsville-100	52.00	52.50	52.50	53.00	.....	.....	.....
Steelton-3	54.00	54.50	55.00	55.50	60.00	.....	.....
Swedeland-28	56.00	56.50	57.00	57.50	.....	.....	.....
Toledo-94	52.00	52.50	52.50	53.00	.....	.....	.....
Troy, N. Y.-4	54.00	54.50	55.00	.....	60.00	.....	.....
Youngstown-8	52.00	52.50	52.50	53.00	.....	.....	.....

DIFFERENTIALS: Add 50¢ per ton for each 0.25 pct silicon over base (1.75 to 2.25 pct, except low phos. 1.75 to 2.00 pct), 50¢ per ton for each 0.50 pct manganese over 1 pct, $2 per ton for 0.5 to 0.75 pct nickel, $1 for each additional 0.25 pct nickel. Subtract 38¢ per ton for phosphorus, content 0.70 pct and over. Silvery Iron: Add $1.50 per ton for each 0.50 pct silicon over base (6.01 to 6.50 pct) up to 17 pct. $1 per ton for 0.75 pct or more phosphorus, manganese as above. Bessemer ferrosilicon prices are $1 over comparable silvery iron.

REFRACTORIES

Fire Clay Brick

(F.o.b. works) Carloads, Per 1000

First quality, Ill., Ky., Md., Mo., Ohio, Pa. (except Salina, Pa., add $5) $94.60
No. 1 Ohio 88.00
Sec. quality, Pa., Md., Ky., Mo., Ill. 88.00
No. 2 Ohio 79.20
Ground fire clay, net ton, bulk (except Salina, Pa., add $1.50) 13.75

Silica Brick

Mt. Union, Pa., Ensley, Ala. $94.60
Childs, Pa. 99.00
Hays, Pa. 100.10
Chicago District 104.50
Western Utah and Calif. 111.10
Super Duty, Hays, Pa., Athens, Tex., Chicago 111.10
Silica cement, net ton, bulk, Eastern (except Hays, Pa.) 16.50
Silica cement, net ton, bulk, Hays, Pa. 18.70
Silica cement, net ton, bulk, Ensley, Ala. 17.60
Silica cement, net ton, bulk, Chicago District 17.60
Silica cement, net ton, bulk, Utah and Calif. 24.70

Chrome Brick

Per Net Ton

Standard chemically bonded, Balt., Chester $82.00

Magnesite Brick

Standard, Baltimore $104.00
Chemically bonded, Baltimore 93.00

Grain Magnesite

St. ⅜-in. grains

Domestic, f.o.b. Baltimore, in bulk fines removed $62.70
Domestic, f.o.b. Chewelah, Wash., in bulk 36.30
in sacks 41.80

Dead Burned Dolomite

F.o.b. producing points in Pennsylvania, West Virginia and Ohio, per net ton, bulk Midwest, add 10¢; Missouri Valley, add 20¢ $13.00

COKE

Furnace, beehive (f.o.b. oven) Net Ton
Connellsville, Pa. ..... $14.50 to $15.00
Foundry, beehive (f.o.b. oven)
Connellsville, Pa. ..... $17.50 to $18.00
Foundry, oven coke
Buffalo, del'd $26.69
Chicago, f.o.b. 23.00
Detroit, f.o.b. 24.00
New England, del'd 24.80
Seaboard, N. J., f.o.b. 22.75
Philadelphia, f.o.b. 22.70
Swedeland, Pa., f.o.b. 22.60
Painesville, Ohio, f.o.b. 24.00
Erie, Pa., f.o.b. 23.50
Cleveland, del'd 25.72
Cincinnati, del'd 25.06
St. Paul, f.o.b. 22.50
St. Louis 25.40
Birmingham, del'd 21.69
Neville Island 23.00

LAKE SUPERIOR ORES

(51.50% Fe; natural content, delivered lower lake ports) *Per gross ton*

Old range, bessemer $8.70
Old range, nonbessemer 8.55
Mesabi, bessemer 8.45
Mesabi, nonbessemer 8.30
High phosphorus 8.30

After adjustments for analyses, prices will be increased or decreased as the case may be for increases or decreases after Dec. 2, 1950, in lake vessel rates, upper lake rail freights, dock handling charges and taxes thereon.

C-R SPRING STEEL

F.o.b. Mill Cents Per Lb.	CARBON CONTENT				
	0.26–0.40	0.41–0.60	0.61–0.80	0.81–1.05	1.06–1.35
Bridgeport, Conn.-58	5.35	6.80	7.40	9.35	11.65
Carnegie, Pa.-41	.....	6.80	7.40	9.35	11.65
Cleveland-2	4.65	6.45	7.40	9.35	11.65
Detroit-68	5.60	6.65	7.25	.....	.....
New Castle, Pa.-40	5.35	6.80	7.40	9.35	.....
New Haven, Conn.-68	5.85	6.75	7.35	.....	.....
Sharon, Pa.-13	5.35	6.80	7.40	9.35	11.65
Weirton, W. Va.-9	5.35	6.80	7.40	9.35	11.65
Worcester, Mass.-2	4.95	6.75	7.70	9.65	11.65
Youngstown-48	.....	6.80	7.40	9.35	11.65

You're looking at a polished section cut from a Duraspun Centrifugal Casting...a casting with 12-14% chromium. It tells better than words of the high quality of Duraspun Centrifugal Castings.

You get a fine, dense, uniform grain structure. Possible air pockets and blow holes are eliminated. Tensile strength is higher than with static castings.

Order Duraspun if you need pipe or tubing. Sizes run up to 15 feet in length; up to 32 inches OD; and down to ¼ inch wall thickness. Odd shaped pieces can be produced providing a circular hole passes uniformly down the center. These, of course, require specially designed casting forms.

If, before ordering or asking us to quote, you would like to know more about our work and facilities, send for our Catalog 3150.

THE DURALOY COMPANY

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METAL GOODS CORP: Dallas · Denver · Houston · Kansas City · New Orleans · St. Louis · Tulsa

BOLTS, NUTS, RIVETS, SCREWS

Consumer Prices

(Base discount, f.o.b. mill, Pittsburgh, Cleveland, Birmingham or Chicago)

Machine and Carriage Bolts

	Pct Off List Less Case	C.
½ in. & smaller x 6 in. & shorter	15	28½
9/16 in. & ⅝ in. x 6 in. & shorter	18½	30½
¾ in. & larger x 6 in. & shorter	17½	29½
All diam. longer than 6 in.	14	27½
Lag, all diam. x 6 in. & shorter	23	35
Lag, all diam. longer than 6 in.	21	33
Plow bolts	34	....

Nuts, Hot Pressed, Cold Punched—Sq

	Pct Off List Less Keg (Reg.)	K.	Less Keg (Hvy.)	K.
½ in. & smaller.	15	28½	15	28½
9/16. in. & ⅝ in..	12	25	6½	21
¾ in. to 1½ in. inclusive	9	23	1	16½
1⅝ in. & larger.	7½	22	1	16½

Nuts, Hot Pressed—Hexagon

½ in. & smaller.	26	37	22	34
9/16 in. & ⅝ in..	16½	29½	6½	21
¾ in. to 1½ in. inclusive	12	25	2	17½
1⅝ in. & larger.	8½	23	2	17½

Nuts, Cold Punched—Hexagon

½ in. & smaller.	26	37	22	34
9/16 in. & ⅝ in..	23	35	17½	30½
¾ in. to 1½ in. inclusive	19½	31½	13	25
1⅝ in. & larger.	12	25	6½	21

Nuts, Semi-Finished—Hexagon

	Reg.		Hvy.	
½ in. & smaller.	35	45	28½	39½
9/16 in. & ⅝ in..	29½	40½	22	34
¾ in. to 1½ in. inclusive	24	36	15	28½
1⅝ in. & larger.	13	26	8½	23
	Light			
7/16 in. & smaller	35	45		
½ in. thru ⅝ in.	28½	39½		
¾ in. to 1½ in. inclusive	26	37		

Stove Bolts — *Pct Off List*

Packaged, steel, plain finished	45—10
Packaged, plated finish	31—10
Bulk, plain finish**	62*

*Discounts apply to bulk shipments in not less than 15,000 pieces of a size and kind where length is 3-in. and shorter; 5000 pieces for lengths longer than 3-in. For lesser quantities, packaged price applies.

**Zinc, Parkerized, cadmium or nickel plated finishes add 6¢ per lb net. For black oil finish, add 2¢ per lb net.

Rivets — *Base per 100 lb.*

½ in. & larger	$7.85
	Pct Off List
7/16 in. & smaller	36

F.o.b. Pittsburgh, Cleveland, Chicago, Birmingham, Lebanon, Pa.

Cap and Set Screws

(In bulk) — *Pct Off List*

Hexagon head cap screws, coarse or fine thread, ¼ in. thru ⅝ in. x 6 in., SAE 1020, bright	54
¾ in. thru 1 in. up to & including 6 in.	48
¼ in. thru ⅝ in. x 6 in. & shorter high C double heat treat	46
¾ in. thru 1 in. up to & including 6 in.	41
Milled studs	35
Flat head cap screws, listed sizes	14
Fillister head cap, listed sizes	34
Set screws, sq head, cup point, 1 in. diam and smaller x 6 in. & shorter	53

S. M. Ferrochrome

Contract price, cents per pound, chromium contained, lump size, delivered.

High carbon type: 60-65% Cr, 4-6% Si, 4-6% Mn, 4-6% C.

Carloads	21.60
Ton lots	23.75
Less ton lots	25.25

Low carbon type: 62-66% Cr, 4-6% Si, 4-6% Mn, 1.25% max. C.

Carloads	27.75
Ton lots	30.05
Less ton lots	31.85

ELECTRODES

Cents per lb., f.o.b. plant threaded electrodes with nipples, unboxed

Diam. in in.	Length in in.	Cents Per lb.
	GRAPHITE	
17, 18, 20	60, 72	17.85
8 to 16	48, 60, 72	17.85
7	48, 60	19.57
6	48, 60	20.95
4, 5	40	21.50
3	40	22.61
2½	24, 30	23.15
2	24, 30	25.36
	CARBON	
40	100, 110	8.03
35	65, 110	8.03
30	65, 84, 110	8.03
24	72 to 104	8.03
20	84, 90	8.03
17	60, 72	8.03
14	60, 72	8.57
10, 12	60	8.84
8	60	9.10

CLAD STEEL

Base prices, cents per pound, f.o.b. mill

	Plate	Sheet
Stainless-carbon		
No. 304, 20 pct.		
Coatesville, Pa. (21)	*29.5	
Washgtn, Pa. (39)	*29.5	
Claymont, Del. (29)	*28.00	
Conshohocken, Pa. (26)		*27.50
New Castle, Ind. (55)	*26.50	*25.50
Nickel-carbon		
10 pct Coatesville (21)	32.5	
Inconel-carbon		
10 pct Coatesville (21)	40.5	
Monel-carbon		
10 pct Coatesville (21)	33.5	
No. 302 Stainless-copper stainless, Carnegie, Pa. (60)		77.00
Aluminized steel sheets, hot dip, Butler, Pa. (7)		7.75

*Includes annealing and pickling, or sandblasting.

TOOL STEEL

F.o.b. mill

W	Cr	V	Mo	Co	Base per lb
18	4	1	—	—	$1.235
18	4	1	—	5	$1.36
18	4	2	—	—	$1.38
1.5	4	1.5	8	—	78.5¢
6	4	2	6	—	87¢

High-carbon chromium ..... 63.5¢
Oil hardened manganese..... 35¢
Special carbon ..... 32.5¢
Extra carbon ..... 27¢
Regular carbon ..... 23¢

Warehouse prices on and east of Mississippi are 3.5¢ per lb higher. West of Mississippi, 5.5¢ higher.

METAL POWDERS

Per pound, f.o.b. shipping point, in ton lots, for minus 100 mesh.

Swedish sponge iron c.i.f. New York, ocean bags	7.4¢ to 9.0¢
Canadian sponge iron, del'd In East	10.00¢
Domestic sponge iron, 98+% Fe, carload lots	15.5¢ to 17.0¢
Electrolytic iron, annealed, 99.5+% Fe	42.5¢
Electrolytic iron, unannealed, minus 325 mesh, 99+% Fe	53.5¢
Hydrogen reduced iron, minus 300 mesh, 98+% Fe	63.0¢ to 80.0¢
Carbonyl iron, size 5 to 10 micron, 98%, 99.8+% Fe	83.0¢ to $1.48
Aluminum	31.5¢
Brass, 10 ton lots	30.00¢ to 33.25¢
Copper, electrolytic	10.75¢ plus metal value
Copper, reduced	10.00¢ plus metal value
Cadmium, 100-199 lb	95¢ plus metal value
Chromium, electrolytic, 99% min., and quantity, del'd	$3.50
Lead	7.5¢ to 12.0¢ plus metal value
Manganese	57.0¢
Molybdenum, 99%	$2.75
Nickel, unannealed	88.0¢
Nickel, annealed	95.0¢
Nickel, spherical, unannealed	92.0¢
Silicon	38.5¢
Solder powder	7.0¢ to 9.0¢ plus met. value
Stainless steel, 302	83.00¢
Stainless steel, 316	$1.10
Tin	14.00¢ plus metal value
Tungsten, 99% (65 mesh)	$6.00
Zinc, 10 ton lots	23.0¢ to 30.5¢

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KEYSTONE GALVANIZED MB SPRING WIRE

The pressure is on to save man hours and reduce production costs without sacrificing quality. That's why it will pay you to investigate the advantages of Keystone Galvanized MB Spring Wire.

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The adaptability and flexibility of Johnson Band Saws in handling all types of cutting is almost unlimited. Rods, tubes, angles, heavy rounds or flats and irregular shapes all can be cut quickly and economically . . . Model B Saw, pictured, offers the high speed and accuracy of a much larger machine. Capacity, 5" rounds and 10" flats; makes a handy saw for large or small shops; with or without casters. Also, Model J, for 10" rounds, 18" flats.

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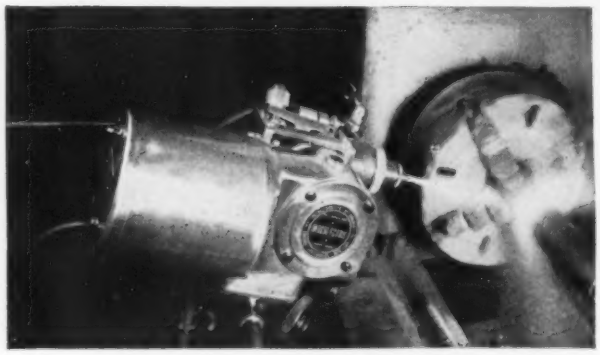
ALBION, MICHIGAN



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ELECTRICAL SHEETS

22 Ga. H-R cut lengths

F.o.b. Mill Cents Per Lb.	Armature	Elec.	Motor	Dynamo	Transf. 72	Transf. 65	Transf. 58
Beech-Bottom-15	.....	7.25	8.50	9.30	9.85	10.40	11.10
Brackenridge-28	.....	7.25	8.50	9.30	9.85	.....	.....
Follansbee-63	6.75	7.25	8.50	9.30	9.85	10.40	11.10
Granity City-22	.....	7.95	9.20	.....	.....	.....	.....
Ind. Harbor-3	6.75	7.25	.....	.....	.....	.....	.....
Mansfield-75	7.25	7.75	9.00	9.80	.....	.....	.....
Niles, O.-64	7.05	7.55	.....	.....	.....	.....	.....
Vandergrift-1	6.75	7.25	8.50	9.30	9.85	10.40	11.10
Warren, O.-4	6.75	7.25	8.50	9.30	9.85	10.40	11.10
Zanesville-7	6.75	7.25	8.50	9.30	9.85	10.40	11.10

Ferrochrome

Contract prices, cents per pound, contained Cr, lump size, bulk, in carloads, delivered. (65-72% Cr, 2% max. Si.)

0.06% C	30.50	0.20% C	29.50
0.10% C	30.00	0.50% C	29.25
0.15% C	29.75	1.00% C	29.00
2.00% C			28.75
65-69% Cr, 4-9% C			22.00
62-66% Cr, 4-6% C, 6-9% Si.			22.60

Foundry Ferrochrome

Contract prices, cents per lb of alloy. Noncontract prices add 2.50¢ per lb.

High carbon 8 Mesh and down.

62 to 66% Cr, 5 to 7% C, 7 to 10% Si.

Carloads, bulk	23.25
Carloads, packed	24.15
Ton lots, packed	27.25

High-Nitrogen Ferrochrome

Low-carbon type: 67-72% Cr, 0.75% N. Add 5¢ per lb to regular low carbon ferrochrome price schedule. Add 5¢ for each additional 0.25% N.

Chromium Metal

Contract prices, per lb chromium contained, packed, delivered, ton lots. 97% min. Cr, 1% max. Fe.

0.10% max. C.	$1.14
0.50% max. C.	1.10
9 to 11% C.	1.08

Low Carbon Ferrochrome Silicon

(Cr 34-41%, Si 42-49%, C 0.05% max.) Contract price, carloads, f.o.b. Niagara Falls, freight allowed; lump 4-in. x down, bulk 2-in. x down, 21.75¢ per lb of contained Cr plus 12.00¢ per lb of contained Si.

Bulk 1-in. x down, 21.90¢ per lb contained Cr plus 12.20¢ per lb contained Si.

Calcium-Silicon

Contract price per lb of alloy, dump, delivered.

30-33% Ca, 60-65% Si, 3.00% max. Fe.

Carloads	19.00
Ton lots	22.10
Less ton lots	23.60

Calcium-Manganese—Silicon

Contract prices, cents per lb of alloy, lump, delivered.

16-20% Ca, 14-18% Mn, 53-59% Si.

Carloads	20.00
Ton lots	22.30
Less ton lots	23.30

V Foundry Alloy

Cents per pound of alloy, f.o.b. Suspension Bridge, N. Y., freight allowed, max. St. Louis. V-5: 38-42% Cr, 17-19% Si, 8-11% Mn.

Ton lots	16.50¢
Less ton lots	17.75¢

Graphidox No. 4

Cents per pound of alloy, f.o.b. Suspension Bridge, N. Y., freight allowed, max. St. Louis. Si 48 to 52%, Ti 9 to 11%, Ca 5 to 7%.

Carload packed	18.00¢
Ton lots to carload packed	19.00¢
Less ton lots	20.50¢

SMZ

Contract price, cents per pound of alloy, delivered, 60-65% Si, 5-7% Mn, 5-7% Zr, 20% Fe, ½ in. x 12 mesh.

Ton lots	17.50
Less ton lots	19.50

FERROALLOYS

Ferromanganese

78-82% Mn, maximum contract base price, gross ton, lump size.

F.o.b. Niagara Falls, Alloy, W. Va., Welland Ont., Ashtabula, O.	$105
F.o.b. Johnstown, Pa.	$187
F.o.b. Sheridan, Pa.	$185
F.o.b. Etna, Clairton, Pa.	$188

$2.00 for each 1% above 82% Mn, penalty, $2.15 for each 1% below 78%.

Briquets—Cents per pound of briquet, delivered, 66% contained Mn.

Carload, bulk	10.95
Ton lots	12.55

Spiegeleisen

Contract prices gross ton, lump, f.o.b.

	16-19% Mn 3% max. Si	19-21% Mn 3% max. Si
Palmerton, Pa.	$74.00	$75.00
Pgh. or Chicago	74.00	75.00

Manganese Metal

Contract basis, 2 in. x down, cents per pound of metal, delivered.

96% min. Mn, 0.2% max. C, 1% max. Si, 2.5% max. Fe.

Carload, packed	34.75
Ton lots	36.25

Electrolytic Manganese

F.o.b. Knoxville, Tenn., freight allowed east of Mississippi, cents per pound.

Carloads	28
Ton lots	30
Less ton lots	32

Medium Carbon Ferromanganese

Mn 80% to 85%, C 1.25 to 1.50. Contract price, carloads, lump, bulk, delivered, per lb. of contained Mn ..... 19.15¢

Calcium Metal

Eastern zone contract prices, cents per pound of metal, delivered.

	Cast	Turnings	Distilled
Ton lots	$2.05	$2.95	$3.75
Less ton lots	2.40	3.30	4.55

Silicomanganese

Contract basis, lump size, cents per pound of metal, delivered, 65-68% Mn, 18-20% Si, 1.5% max. C. For 2% max. C, deduct 0.2¢.

Carload bulk	9.90
Ton lots	11.55
Briquet, contract basis carlots, bulk delivered, per lb of briquet	11.15
Ton lots	12.75

Silvery Iron (electric furnace)

Si 14.01 to 14.50 pct, f.o.b. Keokuk, Iowa, or Wenatchee, Wash., $92.50 gross ton, freight allowed to normal trade area. Si 15.01 to 15.50 pct, f.o.b. Niagara Falls, N. Y., $90.00. Add $1.00 per ton for each additional 0.50% Si up to and including 18%. Add $1.00 for each 0.50% Mn over 1%.

Silicon Metal

Contract price, cents per pound contained Si, lump size, delivered, for ton lots packed.

96% Si, 2% Fe	21.70
97% Si, 1% Fe	22.10

Silicon Briquets

Contract price, cents per pound of briquet bulk, delivered, 40% Si, 2 lb Si briquets.

Carload, bulk	6.95
Ton lots	8.55

Electric Ferrosilicon

Contract price, cents per pound contained Si, lump, bulk, carloads, delivered.

25% Si	20.00	75% Si	14.30
50% Si	12.40	85% Si	15.55
90-95% Si			17.50

Low-Carbon Ferromanganese

Contract price, cents per pound Mn contained, lump size, del'd, Mn 85-90%.

	Carloads	Ton	Less
0.7% max. C, 0.06% P, 90% Mn	26.25	28.10	29.30
0.07% max. C	25.75	27.60	28.80
0.15% max. C	25.25	27.10	28.30
0.30% max. C	24.75	26.60	27.80
0.50% max. C	24.25	26.10	27.30
0.75% max. C, 7.00% max. Si	21.25	23.10	24.30

For other ferroalloys see May 24 issue, p. 160.

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Cold Finished Steel

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Four CONVENIENT MILLS TO SERVE YOU!

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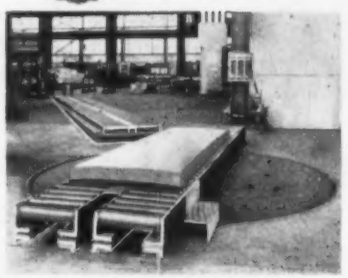

THE ALVEY-FERGUSON COMPANY

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Offices or representatives in principal cities

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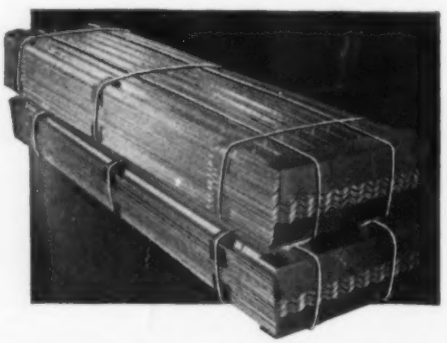

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ROUND STEEL STRAPPING

UNITED STATES STEEL

Other Ferroalloys

Alsifer, 20%, Al, 40% Si, 40% Fe, contract basis, f.o.b. Suspension Bridge, N. Y.
- Carload ..... 9.90¢
- Ton lots ..... 11.30¢

Calcium molybdate, 45-40%, f.o.b. Langeloth, Pa., per pound contained Mo. $1.15

Ferrocolumbium, 50-60%, 2 in. x D, contract basis, delivered, per pound contained Cb.
- Ton lots $4.90
- Less ton lots 4.95

Ferro-Tantalum-columbium, 20% Ta, 40% Cb, 0.30 C. Contract basis, delivered, ton lots, 2 in. x D, per lb of contained Cb plus Ta $3.75

Ferromolybdenum, 55-75%, f.o.b. Langeloth, Pa., per pound contained Mo. $1.32

Ferrophosphorus, electrolytic, 23-26%, car lots, f.o.b. Siglo, Mt. Pleasant, Tenn., $3 unitage, per gross ton $65.00
- 10 tons to less carload 75.00

Ferrotitanium, 40%, regular grade, 0.10% C max., f.o.b. Niagara Falls, N. Y., and Bridgeville, Pa. freight allowed, ton lots, per lb contained Ti $1.35

Ferrotitanium, 25%, low carbon, 0.10% C max., f.o.b. Niagara Falls, N. Y., and Bridgeville, Pa., freight allowed, ton lots, per lb contained Ti $1.50
- Less ton lots 1.55

Ferrouranium, 15 to 18%, high carbon, f.o.b. Niagara Falls, N. Y., freight allowed, carload per net ton $177.00

Ferrotungsten, standard, lump or ¼ x down, packed, per pound contained W, 5 ton lots, delivered $5.00

Ferrovanadium, 35-55%, contract basis, delivered, per pound, contained V.
- Openhearth ..... $3.00-$3.10
- Crucible 3.10- 3.20
- High speed steel (Primos) 3.20- 3.25

Molybdic oxide, briquets or cans, per lb contained Mo, f.o.b Langeloth, Pa. $1.14
- bags, f.o.b. Washington, Pa., Langeloth, Pa. $1.13

Simanal, 20% Si, 20% Mn, 20% Al, contract basis, f.o.b. Philo, Ohio, freight allowed, per pound
- Carload, bulk lump ..... 14.50¢
- Ton lots, bulk lump ..... 15.75¢
- Less ton lots, lump ..... 16.25¢

Vanadium pentoxide, 86 to 89% V_2O_5 contract basis, per pound contained V_2O_5 ..... $1.28

Zirconium, 35-40%, contract basis, f.o.b. plant, freight allowed, per pound of alloy.
- Ton lots ..... 21.00¢

Zirconium, 12-15%, contract basis, lump, delivered, per lb of alloy.
- Carload, bulk ..... 7.00¢

Boron Agents

Contract prices per lb of alloy, del.

Borosil, f.o.b. Philo, Ohio, freight allowed, B, 3-4%, Si, 40-45%, per lb contained B $5.25

Bortam, f.o.b. Niagara Falls
- Ton lots, per pound ..... 45¢
- Less ton lots, per pound ..... 50¢

Carbortam, Ti, 15-21%, B, 1-2%, Si, 2-4%, Al, 1-2%, C, 4.5-7.5%, f.o.b. Suspension Bridge, N. Y., freight allowed.
- Ton lots, per pound ..... 10.00¢

Ferroboron, 17.50% min. B, 1.50% max. Si, 0.50% max. Al, 0.50% max. C, 1 in. x D. Ton lots $1.20
F.o.b. Wash., Pa.; 100 lb up
- 10 to 14% B 95
- 14 to 19% B 1.30
- 19% min. B 1.50

Grainal, f.o.b Bridgeville, Pa., freight allowed, 100 lb and over.
- No. 1 ..... $1.00
- No. 6 ..... 65¢
- No. 79 ..... 60¢

Manganese—Boron 75.00% Mn, 15-20% B, 5% max. Fe, 1.50% max. Si, 3.00% max. C, 2 in. x D, del'd
- Ton lots $1.46
- Less ton lots 1.51

Nickel—Boron 15-18% B, 1.00% max. Al, 1.50% max. Si, 0.50% max. C, 3.00% max. Fe, balance Ni, delivered.
- Less ton lots $1.30

Silcaz, contract basis, delivered.
- Ton lots ..... 45.00¢

BETHLEHEM CARRIAGE BOLTS

Have square necks, and either cut or rolled threads. They come with regular square nuts.

BETHLEHEM LAG BOLTS

Furnished with American Standard Regular Square Heads and gimlet points.

Standard Bolts for Construction

BETHLEHEM MACHINE BOLTS

Made in the following head styles: square, hexagon, button, countersunk (round or square), and tee. They are furnished with cut or rolled threads, and with milled bodies, if desired.

Bethlehem turns out machine, carriage, and lag bolts in styles and sizes to meet virtually every construction requirement. Bethlehem's standard bolts have straight shanks, smooth-fitting threads, and heads which are easy to grip. They are furnished either plain or galvanized.

We also produce a full line of American Standard Regular or Heavy Nuts, both square and hexagonal.

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BETHLEHEM, PA.

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BETHLEHEM STEEL

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